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WOOD

THE MAGAZINE FOR HOME WOODWORKERS

JAN./FEB. 1985•ISSUE NO. 3
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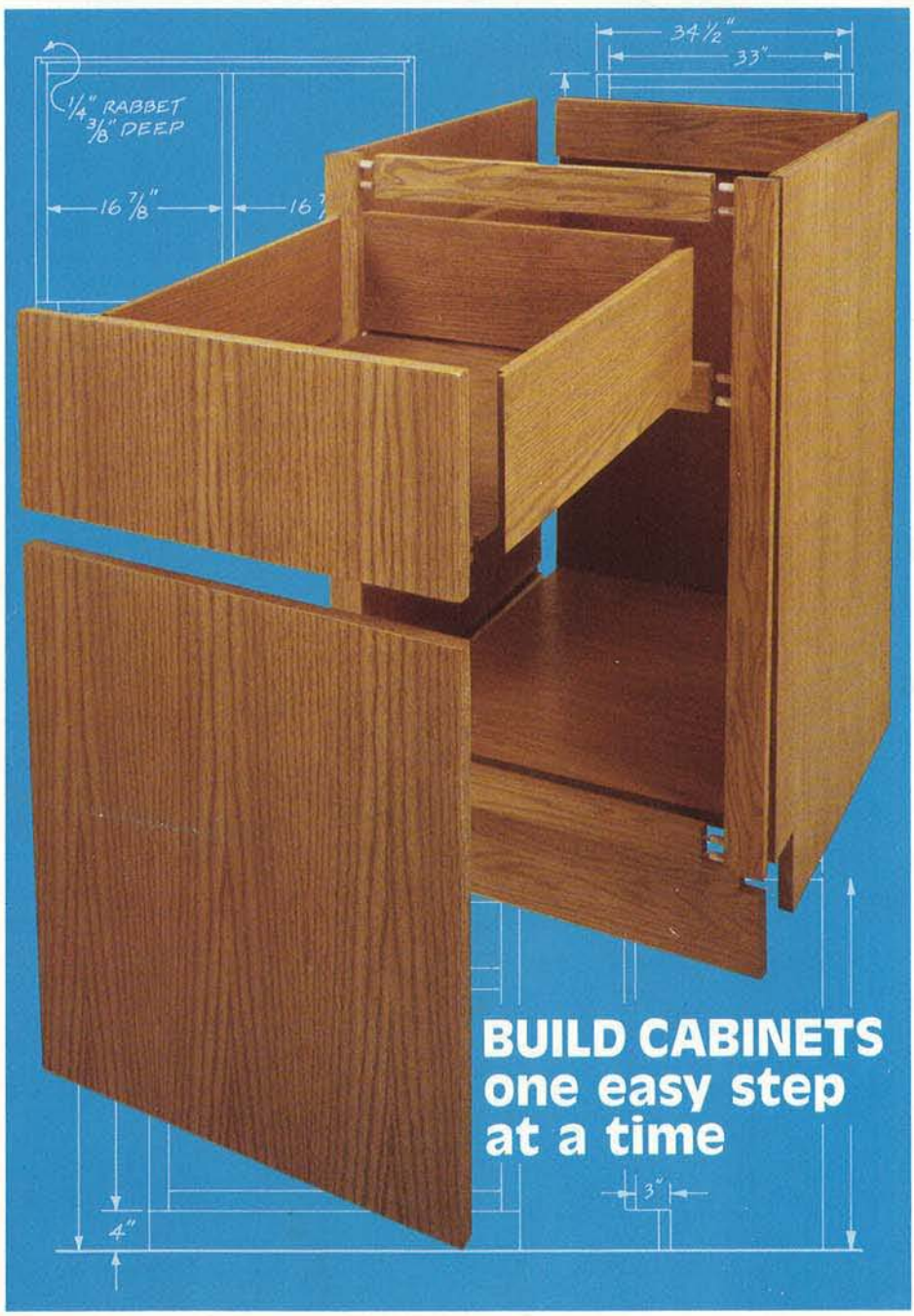
- **BASIC CABINET CONSTRUCTION** how to build them like a pro
- **CLEAR FINISHES** tips on selecting the right one
- **WOOD TESTS** dado blades/sets
- **BUYING LUMBER** by mail
- **PROJECTS GALORE** wooden pulls, stereo unit, cheval mirror, quick-clamp end vise, kid's safe



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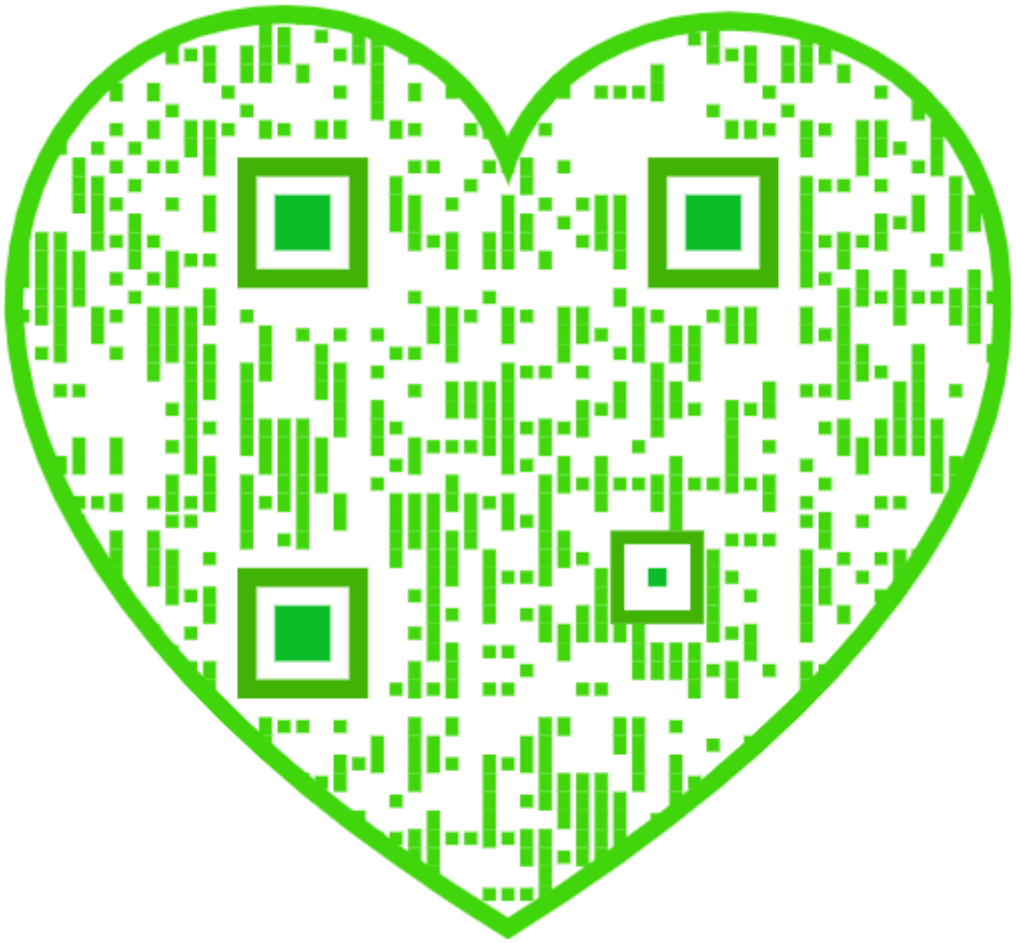

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After all, Delta introduced the original scroll saw back in the '20's.

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DELTA

Behind Our New Name Is Our Old Reputation.

A message to the readers of Wood Magazine from Las Vegas entrepreneurs, Richard Malott and Junior Sealy

WE HIT THE JACKPOT IN LAS VEGAS

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Facts

- Started August, 1980 in the depths of the recession
- Began showing profit after four months
- Sales first year $370,000
- Sales second year $725,000
- Recovered entire initial $90,000 investment in 20 months
- Doubled our warehouse capacity July, 1983 from 6,000 to 12,000 square feet
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Opinions

We couldn't have done it without the flexibility and expertise provided by the Austin Hardwoods program. The parent company has worked hand-in-hand with us, keeping us abreast of changing market conditions, new products, and effective marketing techniques. Their program allows the franchise owners to tailor their operation towards any ratio of retail/wholesale and hobbyist/commercial sales, and to grow as fast as they are able. Sure there was a lot of hard work, but the record speaks for itself. Our Austin Hardwoods franchise turned out to be a sure bet.

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Jan./Feb. 1985 Issue No. 3

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Circle A, B or C for each question:

1 How much experience do you have in woodworking, home repair and/or home maintenance?

A) Little or no experience.
B) Some experience.
C) A great deal of experience.

2 Which phrase best describes your workshop?

A) A selection of hand tools and portable power tools.
B) A table saw or radial arm saw, along with hand tools and portable power tools.
C) A good selection of stationary and portable power tools, along with hand tools.

3 How involved do you want to become with woodworking, home repair and/or home maintenance?

A) Not very involved.
B) Moderately involved.
C) Heavily involved.

4 What's the likelihood that you'll buy some kind of woodworking tools within the next year?

A) Not likely.
B) Somewhat likely.
C) Highly likely.

5 Which describes you?

A) I do home repairs and maintenance only when it can't be done any other way.
B) I do some woodworking and a variety of home repairs and maintenance.
C) I'm primarily interested in fine craftsmanship woodworking.

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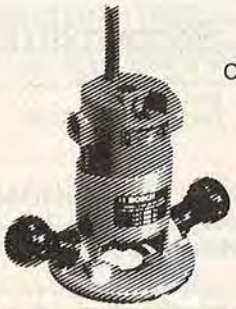

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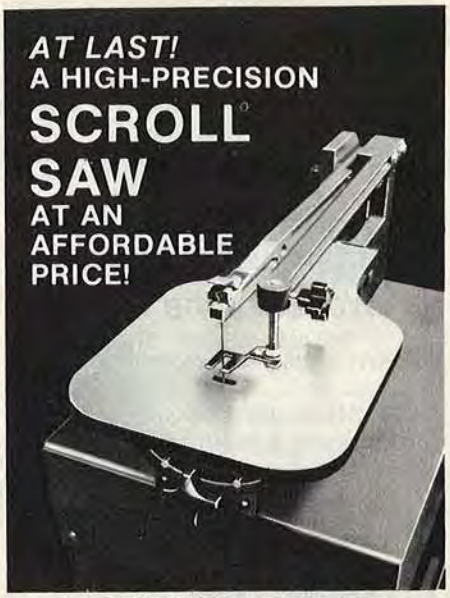

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The Editor's Angle

It wasn't easy, but I finally managed to round up the WOOD staff for a group mug shot the other afternoon. If some of these people look sleepy, you'll have to forgive them. They've been up late lots of nights making sure this magazine reaches you on time every two months. I'll go from left to right and front to back.

Marlen Kemmet, WOOD's How-To Editor, comes to us from Devil's Lake, North Dakota. Marlen's interest in woodworking knows no bounds; in fact, after hours, it's not unusual to find him turning a bowl or working on some other project in the shop.

I'm seated in the chair between Marlen and Jim Boelling, our Project Builder. Jim has been actively involved in woodworking since 1968, both as a practitioner and, since 1976, as a teacher of adult education classes.

Lee Gatzke, WOOD's Art Director, wears lots of hats around here, in addition to laying out the magazine. Lee's training in commercial art, his years of magazine design experience, and his knowledge of and skill in woodworking make him a valuable member of the staff.

In the back row, far left, is Pete Stephano, a veteran magazine man and our Features Editor. Pete does most of our Craftsman Close-Up features, travels around quite a bit gathering new material, and also coordinates the efforts of some of our free-lance writers.

To Pete's left sits Jim Downing, Design Editor. Jim's years of practical woodworking experience, his commonsense approach to figuring things out, and his well-developed design sense have found a home at WOOD.

Darlene Reynolds, WOOD's Administrative Assistant, makes order out of chaos everywhere she goes. Every operation in America should be blessed with someone with her considerable skills.

Print this article

Larry Clayton

Like Having A Lumberyard Right in Your Shop!

PLANER MOLDER JOINTER 4-IN-1 POWER-FEED SANDER

Here's What Woodmaster Owners Say:

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Jay Hedden, Editor, Workbench Magazine

Gets More Done — "I build grandfather clocks, music boxes, toys and picture frames. They say a craftsman is only as good as his tools, and let me tell you, my Woodmaster is tops. I get more done, and done right, than I ever did before."
R.V. Delacourt, Cleveland, Ohio

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Quickley converts machine to one of the finest drum sanders available. Consistent power feed eliminates "low spots" and irregularities caused by hand sanding method.

Factory-Direct Shipment Keeps Cost Low!
Woodmaster Tools is the exclusive national direct-by-mail source for these planers. Low price includes motor, switch, stand, knives, full instructions ... ready to use. Easy terms.

Jointer attaches in seconds ... designed to let you move directly to planing without changeover.

Produces tongue & groove with one set-up, two boards in same pass.

Turns out high-value, satin-smooth custom moldings plus all popular patterns.

New sanding attachment quickly converts machine to a power-feed drum sander!

FREE 30 DAY TRIAL!

Send for complete facts on how you can try this low-cost, 4-in 1 power tool in your own shop for 30 days completely without risk! We'll also send you complete details on how you are fully protected by Woodmaster's One Full Year Limited Warranty.

FREE INFORMATION KIT

MAIL COUPON TODAY OR CALL TOLL-FREE 1(800) 824-7888 Oper. 642

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YES! Please rush me your FREE Information Kit which tells in words and pictures why this amazingly designed power-feed shop is so much better than other single-purpose or combination tools. Also send me details on your 30-DAY FREE TRIAL GUARANTEE.

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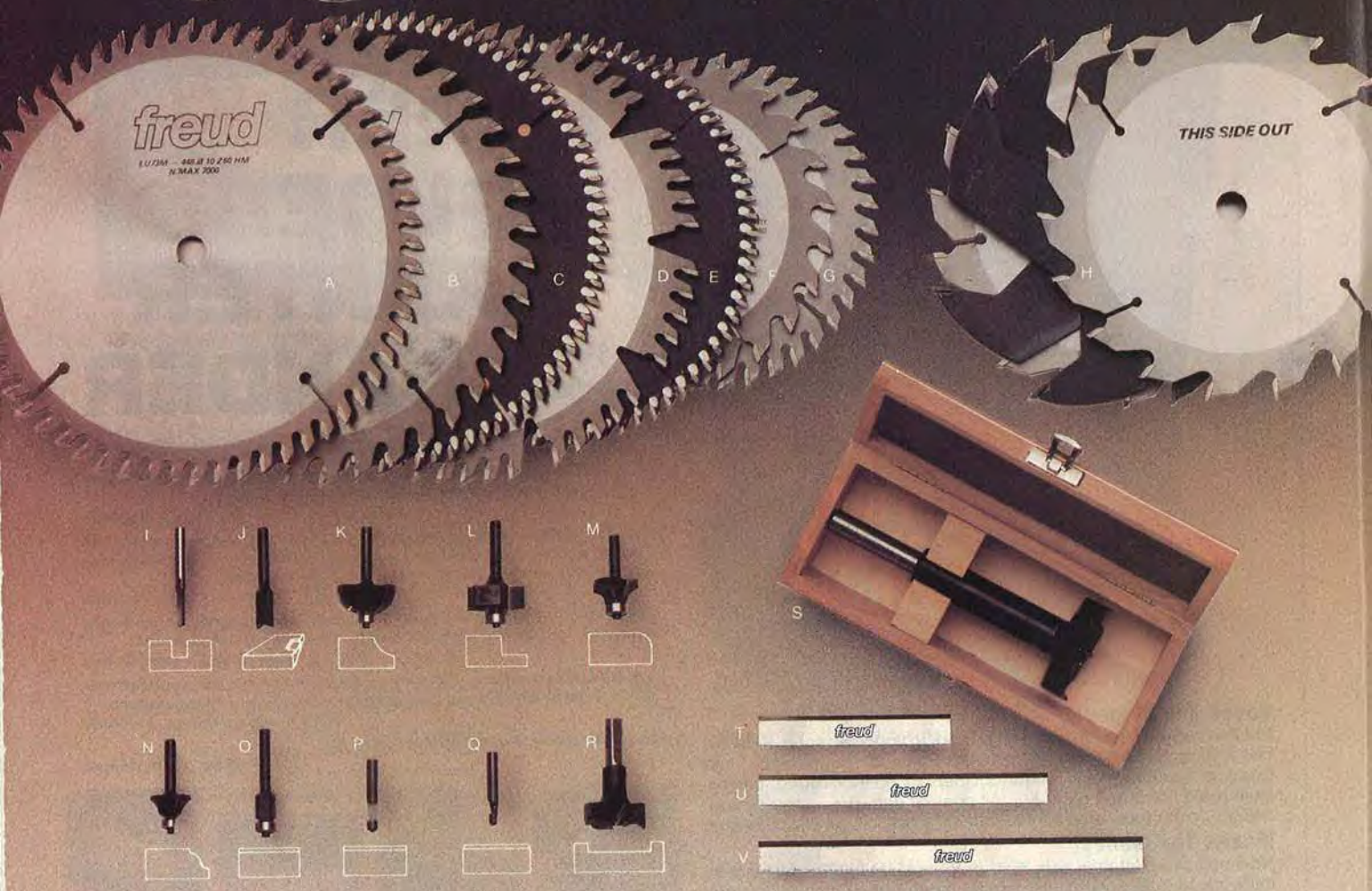
SUPERSALE



	ITEM	DESCRIPTION	LIST	SALE
A	LU73M010	10" x 60 Teeth Gen. Purpose ATB	$ 79.65	$ 44.90
B	LU72M010	10"x 40 Teeth Gen. Purpose ATB	68.58	39.90
C	LU85M010	10" x 80 Teeth Super Saw ATB	110.88	73.90
D	LU84M011	10" x 50 Teeth Combination 4 & R	74.51	44.90
E	LU85M009	9" x 72 Teeth Super Saw ATB	101.98	64.90
F	PS203	7¼" x 24 Teeth Gen. Purpose ATB	27.45	18.90
G	PS303	7¼" x 40 Teeth Gen. Purpose ATB	32.97	24.90
H	DS308	#3 Dado 8" Max. Width of Cut $^{13}/_{16}$"	170.25	119.50
I	04-106	¼" Diam. ¾" Cut. Length Solid Carbide	11.05	8.80
J	16-100	½" Diam. Mortising Bit C.T.	12.73	10.10
K	30-106	½" Radius Cove Bit C.T.	33.64	25.90

	ITEM	DESCRIPTION	LIST	SALE
L	32-100	1¼" Diam. Rabbeting Bit C.T.	$ 27.62	$ 22.10
M	34-110	¼" Radius Rounding Bit C.T.	27.62	22.10
N	38-100	$^{5}/_{32}$" Radius Ogee Bit C.T.	32.90	26.30
O	42-106	½" Diam. ½" Cut. Length Flush Trimming Bit	15.62	12.50
P	64-100	Solid Carbide Flush Trim Bit	7.64	6.10
Q	66-100	Solid Carbide 7° Bevel Bit	8.30	6.64
R	3557R	35MM Diam. 10MM Shank Boring Bit	31.90	25.50
S	06218	2⅛" Diam. ½" Shank Boring Bit	89.00	69.80
T	C310	Set of 3 4" x ⅝" x ⅛" Jointer Knives	18.29	13.40
U	C350	Set of 3 6" x ⅝" x ⅛" Jointer Knives	27.45	19.90
V	C441	Set of 3 8" x ⅝" x ⅛" Jointer Knives	36.58	28.90

Sales Ends April 30, 1985

Note: All Saws & Dado have $^{5}/_{8}$'' Bore
All Router Bits have ¼'' Shank
ATB = Alternate Top Bevel
4 & R = 4 Teeth & 1 Raker Tooth
C.T. = Carbide Tipped

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Call us for the name of your nearest Freud distributor.

TALKING BACK

LETTERS

We welcome comments, criticisms, suggestions . . . even an occasional compliment from readers. While the volume of mail we receive makes it impossible to answer every letter, we intend to publish exerpts from a cross section of our correspondence in each issue of the magazine. Send letters to:

Letters Editor
Better Homes and Gardens®
***WOOD* Magazine**
1716 Locust Street
Des Moines, IA 50336

I cannot locate the 10-24 brass knurled nuts for the Collector's Edition Marking Gauge (WOOD, Sept./Oct. 1984, page 62).

—Hugo Gregory,
Yonkers, N.Y.

When we built the marking gauge, we walked into a local hardware store and bought brass knurled nuts manufactured by Midwest Fastener of Kalamazoo, Michigan. Apparently we had better luck than a number of readers, because we received several letters similar to Mr. Gregory's.

We haven't been able to locate a mail-order source for these nuts. Can any reader help?

Am well pleased with your advertising segments, as I just know there have to be cheaper places to buy tools and supplies than the local hardware stores.

—Jean Dresselhaus,
Lewiston, Minn.

Your magazine already has too much advertising, and that is why I have quit subscribing.

—Harold Sweeney,
Lancaster, Wis.

"It is a very hard undertaking to seek to please everybody," Publius wrote in the first century B.C. When it comes to the topic of advertising, nothing seems to have changed in 2,000 years.

Advertising revenues pay many of the bills around here, and when we're looking to buy tools and supplies, we join reader Dresselhaus and read all the ads we can find. We're sorry that Mr. Sweeney feels differently, and we'll miss him as a subscriber.

I want to tell you how much we have enjoyed the first issue of your magazine, *WOOD*. I work for Kittinger's Furniture Company as a cabinetmaker. I also have a workshop at home and build for family and friends. I have searched for many years for a magazine such as yours with fresh ideas and *good* instructions to expand my own ideas.

My wife loves the magazine. We both feel that it is going to be a welcome addition to our household.

Welcome to our home.

—Alfred and Diana Jacob,
West Seneca, N.Y.

We're honored to be invited into your home, and we'll do our best not to wear out our welcome. ■

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Skilled Swiss craftsmen forge, finish, and sharpen the blades by hand. High quality steel alloy is hardened and tempered to Rc58-60, resulting in an edge which will stay extremely sharp during long periods of carving. The octagonal handles are select European ash and designed for optimum control. We believe our 'Swiss Made' carving tools shape all woods more precisely than any other tools made.

This set includes six of the most popular shapes, making it perfect as a starter set – or a replacement for those tools that fall short of your expectations. It's also the perfect set to build on. We offer over 200 additional styles, all of unequaled quality. Our 6-pc. set contains: 3mm veiner; 8mm chisel; 6mm "V" parting tool; 10mm #9 sweep gouge; 10mm #7 sweep gouge; 12mm #5 sweep gouge. Overall length 9½" to 11". All presharpened and ready to use. Money back guarantee. Reg. $59.95.

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Credit card orders call 800-225-1153

Yes, please send me your 6-pc. 'Swiss Made' Carving Tool Set 05W10-ZZ. I enclose $49.95 (add 5% sales tax for delivery in Massachusetts) or charge my ☐ VISA ☐ MasterCard ☐ AMEX

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buying a basic, commonsense tool kit

Perhaps you've just completed a beginning woodworking course, or maybe you've recently assembled your first kit project. You thoroughly enjoyed these tastes of woodworking, and now you're ready for bigger challenges. But one obstacle blocks your way; you don't own the proper tools.

What tools does a beginning woodworker need, and how should he or she acquire them? In an unscientific poll of WOOD staff members, we assembled a basic tool kit for woodworkers—tools we think should be a part of any woodworking shop. With this equipment—and skill—you can perform most woodworking operations.

As you read the list, you'll notice we don't mention stationary power tools—the table saws, drill presses, band saws, and jointers that professional woodworkers and serious amateurs swear by. We left them out because this is a *basic* tool kit.

In at least one case, we did so with great reluctance. All of us would have liked to include a table saw in the package, but we omitted it for reasons of economy.

Even without the table saw, if you walk into your local tool shop and ask for everything on our list, the clerk might ask you for a $1,000 bill. How can you get a start in this hobby without robbing a bank? We believe the answer is to plan carefully and buy wisely.

Plan Ahead

Equip your shop a few tools at a time. As your skills improve, so will your tool inventory. In this basic kit, we list the tools that we find indispensable in **bold-face type.** They're the items you're likely to find most useful and use most often, so think about purchasing them first.

Can you sidestep any processes for which you're not well equipped? Some retail wood outlets will joint, rip, thickness, and crosscut lumber to size, for example. You pay for this service, of course, but in the short run it's less expensive than buying the tools you'd need to do the work yourself.

As you budget each new project, try to figure in the purchase of one new and necessary tool. You'll spread out the cost of equipping your shop, and you'll be able to enjoy a new tool with each new project.

Finally, remember that there *are* woodworkers who make exceptional pieces with hand tools only. We are addicted to the power tools in our shop, but we know that life can go on without them.

Continued

Your screwdriver just became obsolete.

Once you've used the Skil Cordless Screwdriver, you won't want to go back to your old screwdriver. The Skil Cordless Screwdriver weighs mere ounces and is so small it fits into your pocket. Yet its high torque motor has the power to drive up to 500 screws on a single charge.

The Skil Cordless Screwdriver recharges in 3 hours or less and even has a special built-in feature to help prevent stripping of screws. And since it's cordless, it's perfect for everything from everyday fixups in or out of the house, to serious do-it-yourself projects.

With everything it can do, you'd think the Skil Cordless Screwdriver would be expensive, but it's not. Not at all. And its surprisingly low price makes it a great gift.

So forget about all the stripped screws, tired arms and blisters that went with your ordinary screwdriver. The Skil Cordless Screwdriver just made them obsolete.

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800 421 0256

Fisher Hill Products
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Fitzwilliam, NH 03447

TOOL BUYMANSHIP

Continued from page 10

basic, commonsense tool kit

Be a Smart Tool Buyer

When you're ready to buy tools, shop carefully. Check more than one store, read all the catalogs you can obtain (the information they contain will save you substantially more than the few dollars they may cost), and *always, always look for sales and specials.*

Mail-order advertisements in magazines such as WOOD regularly offer substantial price reductions on top-quality tools. And sales are such normal marketing techniques at several nationwide retail chains that it sometimes seems difficult to pay full retail price for their popular tools.

Many manufacturers offer several product lines: inexpensive tools for "hobbyists" and more elaborate heavy-duty models for commercial and professional use. How much tool do you need?

In general, it makes sense to buy the best equipment you can afford, particularly when you're purchasing hand tools. It's unlikely that a good saw or plane will become obsolete, and with basic maintenance there's no reason why these tools can't last for centuries. The thought that a great-great-grandchild might one day enjoy using your combination square could make spending extra dollars seem like a wise investment.

When it comes to power tools, however, it gets easier to fall into the "overkill" trap. If a 1-horsepower router will be entirely adequate for your needs, do you really need a 3-horsepower model?

Good tools don't go out of style. A 100-year-old hand plane or wood chisel looks pretty much the same as a brand-new one, and some woodworkers insist that, the older the tool, the higher the quality. As this issue's article about classic saws demonstrates, old tools can actually be more expensive than new models. But auctions and newspaper classifieds are often good sources for low-cost, high-quality items, so think about buying your

Continued on page 14

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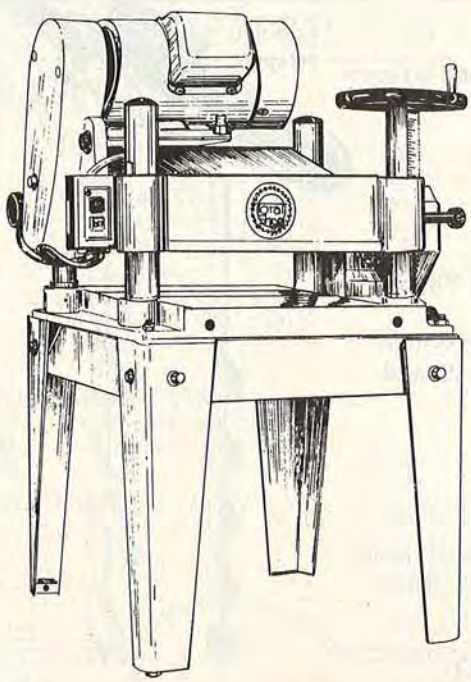

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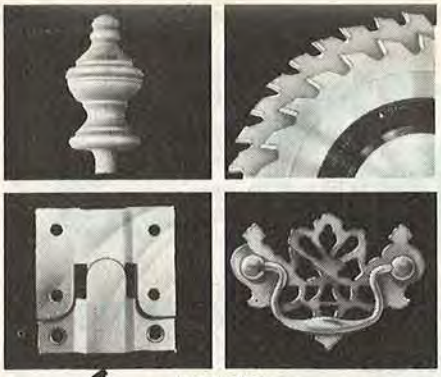

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KLOCKIT

TOOL BUYMANSHIP

Continued from page 12

basic, commonsense tool kit

tools used. You might even find a great deal on that table saw we'd so much like you to have.

Basic, Commonsense Tool Kit

Measuring tools:
- **Combination square**
- Sliding bevel
- Marking gauge
- Framing square
- **Steel tape (10′ or 12′)**
- Folding rule
- **Compass**
- Scratch awl

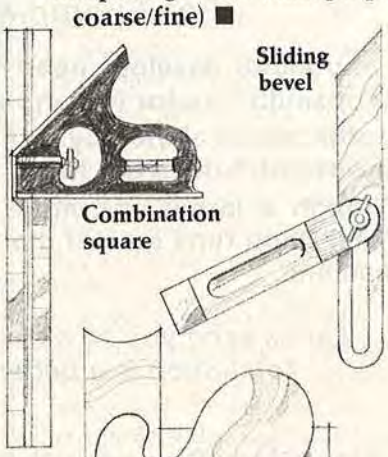
Cutting tools:
- **Crosscut saw (12 pt.)**
- Rip saw (6½ or 7½ pt.)
- **Backsaw or dovetail saw (15 tpi)**
- Coping saw
- Hacksaw
- Slip-joint pliers
- Needlenose pliers
- Diagonal cutters

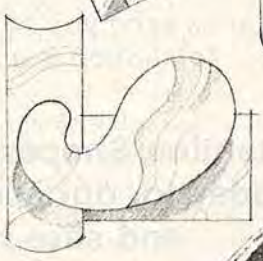
Shaping tools:
- Smooth plane
- Low-angle block plane
- **Wood chisels (¼″, ½″, ¾″, 1″)**
- Single-cut mill bastard file
- Round rasp
- Flat rasp
- **Cabinet scraper and hand scrapers**
- Utility knife

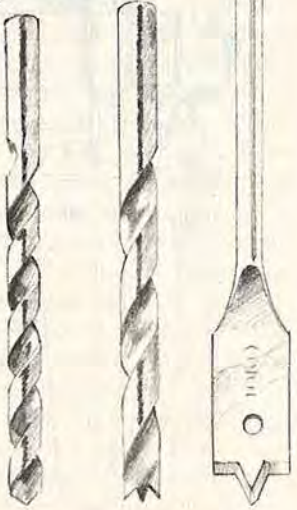
Joining tools:
- **Claw hammer (16 oz.)**
- Finish hammer (8 oz.)
- **Nail set**
- Wooden mallet
- **Screwdrivers (Straight, Phillips)**
- Doweling jig
- Bench vise or clamping system
- **Bar or pipe clamps (2–3′ and 2–5′ min.)**
- Handscrews
- **C-clamps**

Portable power tools:
- Router (1 HP, ¼″ collet)
  - (Purchase bits as needed: bead, chamfer, cove, dado, straight, round-over, rabbet)
- Circular saw (7¼″)
- **Drill (⅜″ variable speed)**
- **Twist drills (1/16″–⅜″)**
- Spade shaped drill bits
- Brad point drills
- Saber saw
- **Dual-action pad sander (straight-line and orbital)**
- **Belt sander (3″ × 21″ with dust collection)**

Safety and maintenance:
- **Face shield or safety glasses**
- **Hearing protector**
- **Dust mask or respirator**
- **Sharpening stone (dual-purpose, coarse/fine)** ■







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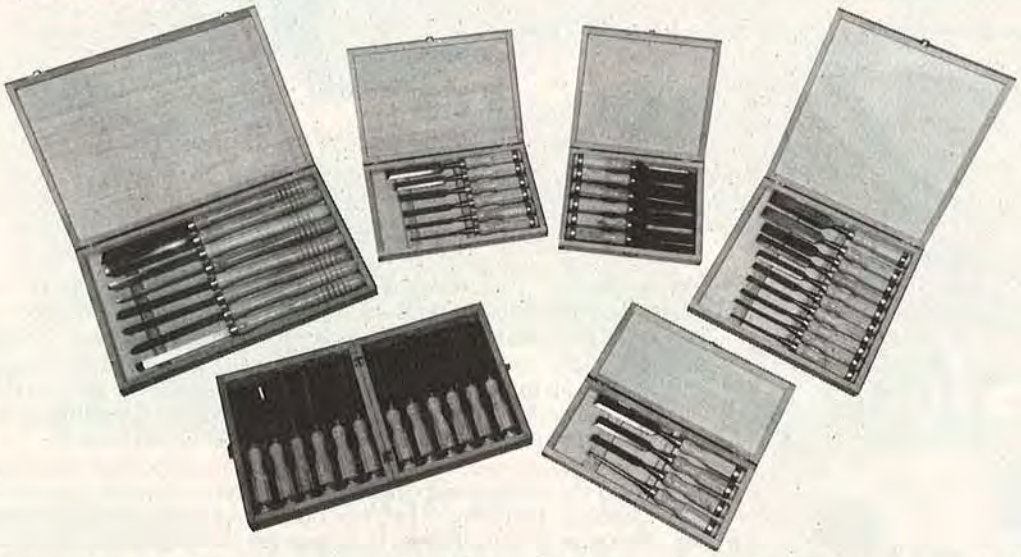
Freud's high quality hand tools are an outstanding value! These items incorporate features that the most demanding professional will appreciate — at surprisingly low prices!

All blades are precision ground **chrome vanadium**, assuring very long tool life. The chisels and carving tools have handles of rare, close grained **Boxwood**, hooped at both top and bottom. The turning tools have long Ash handles. Each set comes complete with it's own wooden box for storage.

Discover the pleasure of using fine hand tools with these new products from Freud. They also make a great gift!



WC104	4 pc. Chisel Set	$26.95
WC106	6 pc. Chisel Set	$33.95
WC110	10 pc. Chisel Set	$55.95
CS106	6 pc. Carving Set	$ 64.95
CS112	12 pc. Carving Set	$114.95
TT108	8 pc. Turning Set	$56.95

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LM72M	10", 24t, flat top rip	$ 42.00
LU73M	10", 60t, ATB cutoff	$ 42.00
LU84M	10", 50t, smooth comb.	$ 42.00
SET	ALL THREE ABOVE	$125.00
LU82M	10", 60t, triple chip	$ 49.00
LU85M	10", 80t, super blade	$ 72.00
DS306	6" dado 1/4" - 13/16"	$ 99.00
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TR100	3 blades and 8" dado	$259.00

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You get nearly 50 measured construction plans for tables, chairs, beds, cabinets, lamps, benches, a dry sink, mobile greenhouse, butcher block, tea cart, gateleg table, campaign desk, grandmother clock, rolltop desk, hutch, lounger, candlestand, full-function wall unit and much, much more!

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FREE when you join

This handy Shop Guide measures in inches, centimeters. It's also a compass, protractor, drill and chisel grinding gauge, bolt and screw sizer, bolthead and penny nail measurer, and more!

Working an entire edge with a pattern. The collar and pattern are in the lower position. The work is held to the pattern with several brads driven through the bottom of the pattern.

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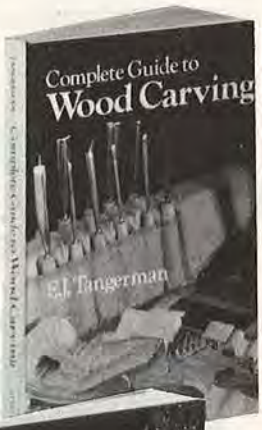

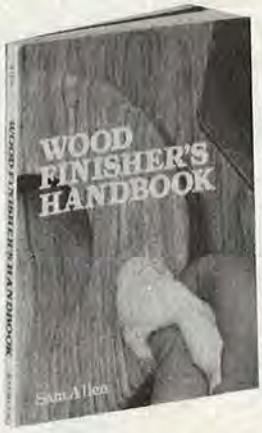

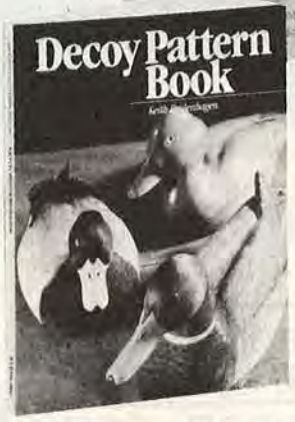

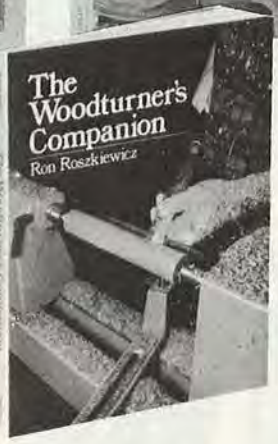

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Threaded inserts for wood

These inserts can be installed with a screwdriver, although we prefer to use a drill press (see page 51). Once in place they provide sturdy threads where you want them. Simply drill a hole the same size as the insert, then install a little below the surface. Available in ¼" and 5/16" sizes. *Threaded Inserts. $26 per 100 ($.32 each) plus shipping and handling. We ordered ours from The Woodworkers' Store, Dept. W, 21801 Industrial Blvd., Rogers, MN 55374, but they're available at large retail outlets.*

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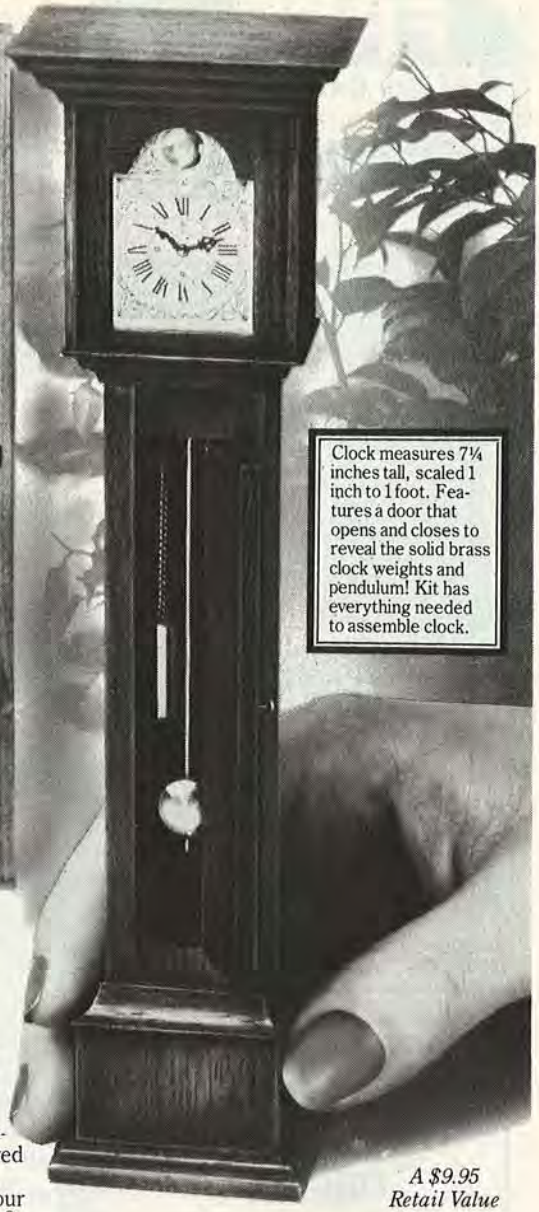
Continued on page 24



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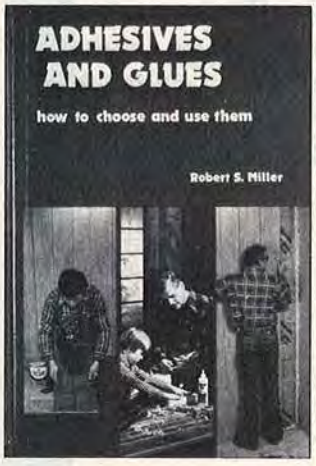
By Robert S. Miller
Franklin Chemical Industries. Columbus, Ohio. 1980. 186 pages. $6.95



The goal of this book is to help people choose an appropriate adhesive for practically any "putting-it-together" task. In the process, author Robert Miller draws on more than 30 years of experience in the adhesives industry to share valuable ideas, useful tips, and practical information. Numerous photographs and drawings illustrate his points.

In a chapter on wood glues, Miller compares ready-to-use products, water-mixed adhesives, and two-part adhesives. Pointing out that the integrity of glue joints is important to both the durability and appearance of a woodworking project, he offers a detailed discussion of wood-grain direction, shrinkage, and major joint types.

A thorough examination of clamping includes plans for making a variety of clamps—a picture frame clamp and a simple spring clamp, for example—and discusses wedging and other homemade set-ups. The author covers joinery, veneering, and laminating as well.

Miller devotes a valuable chapter to basic repair techniques, and talks about mending split or broken parts, tightening loose joints, repairing drawers, and replacing broken veneer. He also discusses contact adhesives and their uses, and he addresses one question that has plagued woodworkers for generations, "Why didn't it stick?" ■

Print this article

"The adhesive or glue is only a minute part of the total cost of your project in terms of time, labor, and materials. Therefore, the little time it takes you to familiarize yourself with the label copy and directions is just some added insurance for you to achieve a better and more professional job."

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BOOKS WORTH READING

Adventures in Wood Finishing:

88 Rue de Charonne. By George Frank. The Taunton Press, Inc., Newtown, Conn. 1981. 120 pages. $9.95

Although wood finishing may not sound like the stuff of which adventures are made, the title of George Frank's engaging book turns out to be entirely appropriate. With such clients as the Baron Rothschild, the Pasha of Marrakesh, and the "ex-khedive of a certain North African country," and such experiences as being locked in a bank with a gang of amateur robbers, Frank's career as a master of stains and wood coloring has been anything but dull.

Working out of a small shop at 88 Rue de Charonne in Paris, a few of his professional challenges have involved finding a way to duplicate the color of virgin hemp in wood, helping to make and finish a set of 34 Louis XIV chairs for the Royal Court of Egypt, and finishing all the woodwork in a bank lobby two days before its grand opening.

Frank blends personal anecdotes with practical information throughout the book. He talks about protecting wood, changing its color and tactile characteristics, accentuating wood markings with colored fillers, and also discusses charring and sandblasting wood surfaces.

Woodworkers who haven't ventured much beyond conventional staining and varnishing because most volumes on the subject remind them of high-school chemistry texts will find this book a pleasant way to broaden their wood-finishing skills and knowledge. ■

"More wood is ruined by finishing under improper lighting than it is by any other single cause . . . You must have as much light as possible and it must be as close as possible to natural daylight."

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BOOKS WORTH READING

The American Shakers and Their Furniture.

By John G. Shea.
Van Nostrand Reinhold Co.
New York, 1971. 208 pages.
$10.95

This is a "How-they-did-it"—not a "How-to-do-it"—book, author John Shea explains as he examines the American Shakers of more than a century ago and investigates their superlative craftsmanship in detail.

Shea believes that understanding this workmanship—and the underlying economy of detail that allowed furniture of great strength to be fashioned from remarkably delicate parts—depends on knowing how the Shakers lived, worshipped, and worked. In search of this knowledge, he traces the history of the movement, from its beginning in England to its gradual decline, a decline caused in part, no doubt, by the Shaker belief in celibacy.

But if celibacy was the best-publicized Shaker characteristic, Shea believes that inventiveness was the most important Shaker trait. He notes that it contributed to the design of original types of chairs, chests, and desks.

Shaker craftsmen were highly skilled in all phases of cabinetry and allied trades. They used the most advanced tools of the day and often invented implements—a tongue-and-groove machine and a circular saw among them.

What may be of greater interest to home woodworkers, however, are the 88 scale drawings—one-half of the book—that are based on measurements of Shaker museum pieces ranging from candle sconces to classic chairs, tables, and chests. ■

"Shaker furniture is, above all, functional. It works and it serves. In strict adherence to practical principles, it discards all adornments of decorative embellishment which do not contribute to basic requirements."

"While they can't be credited with 'inventing' the rocking chair, the Shakers did more to develop its design and promote its use than any other chairmakers."

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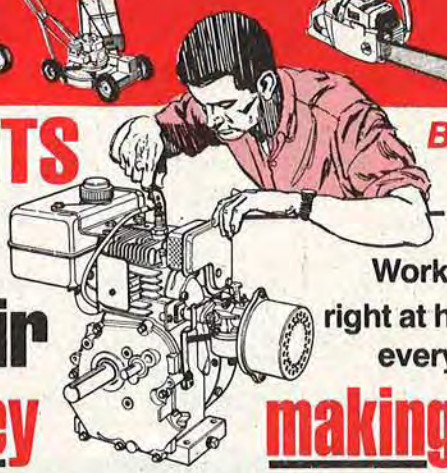

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TIPS FROM YOUR SHOP (AND OURS)

No one knows everything about woodworking, but, with experience, we all run into better, safer, faster, or easier ways to do things. When we come up with interesting tips or techniques, we'll show them to you in this column. And when you share your favorites, we'll pay you $25 for each submission we publish. No shop tips will be returned. Send your tips to:

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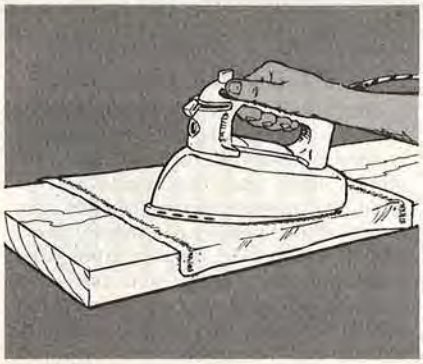
Raising dents and scratches

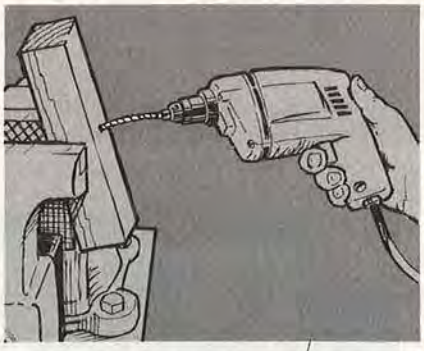
Even the smallest dents and scratches mar the appearance of otherwise successful woodworking projects. To remove small dents or raise minor scratches in wood surfaces, wet and then cover the problem area with a damp cloth. Using a household iron on a dry setting, apply heat to the cloth for 15-second intervals. Take care to avoid scorching the wood.



Drill-bit straightener

Small-diameter drill bits are easily bent during normal use. To straighten a bent bit, chuck it into your drill and, while running the drill at full speed, insert the drill point into a piece of scrap wood. Apply slight sideways pressure to the drill to return the bit to its proper shape. When you release the pressure, the bit will continue to run true.

—Robert S. Tupper, Canton, S.Dak.



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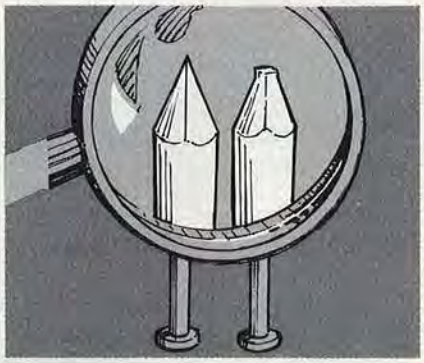
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 34

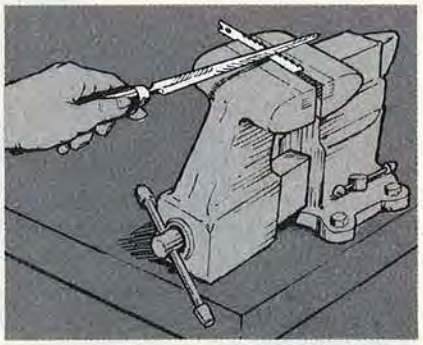
Avoiding nail splits

Even though you hammer carefully, your nail occasionally splits the wood. Blunt the tip of the nail by tapping it with your hammer to let the nail cut its way into the wood rather than part the material. Or chuck a proper-sized nail into a drill (you may need to cut off the nail head), pre-drill holes, and then hammer and set nails.



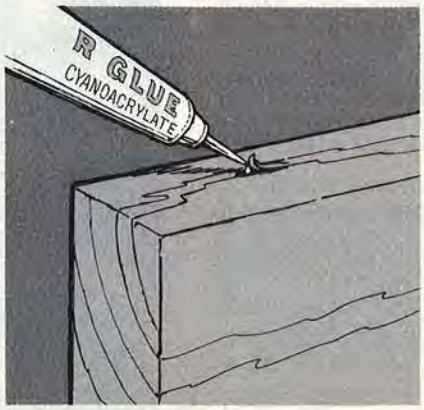
First-aid for dull saber-saw blades

Halfway through a "must-do" project, you discover that the blade on your saber saw is dull, and you don't have a spare. Touch up the blade with a triangular file. Place the blade in a vise with teeth pointing up (don't pinch them). File away from you, giving each tooth two or three quick strokes. Rotate the blade 180°, and file the other side.



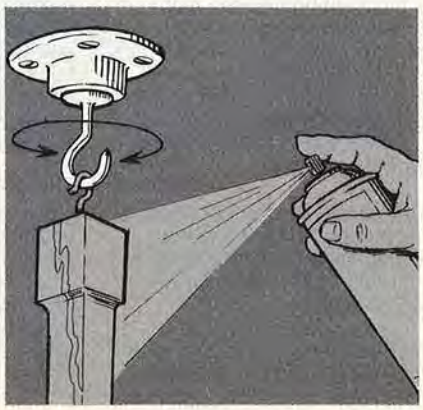
Repairing torn grain

No matter how skillful you are with a plane, the grain patterns of some wood species make it almost impossible to avoid raising and tearing the grain. To fix tears, apply several drops of cyanoacrylate adhesive (the "super" variety made for wood and leather) to the affected area. Sand the spot immediately. Sanding presses the raised wood down, generates heat to set the glue, and produces fine sawdust that mixes with the glue to create an invisible and permanent repair.
—Dean Case, Nevada City, Calif.



World-champion finishing jig

Applying finish to more than one side of an object is an awkward, messy chore. A steel swivel made to support a boxer's punching bag makes an ideal shop aid for holding objects that need finishing. Attach the swivel to a secure overhead support, screw an eye-hook into the object to be finished, and hang the piece on the swivel. The workpiece —not the woodworker—does all the moving. (A plant hanger that swivels is an inexpensive alternative for working with light objects.)
—Tony Bofinger, Punxsy, Pa.



Continued on page 38

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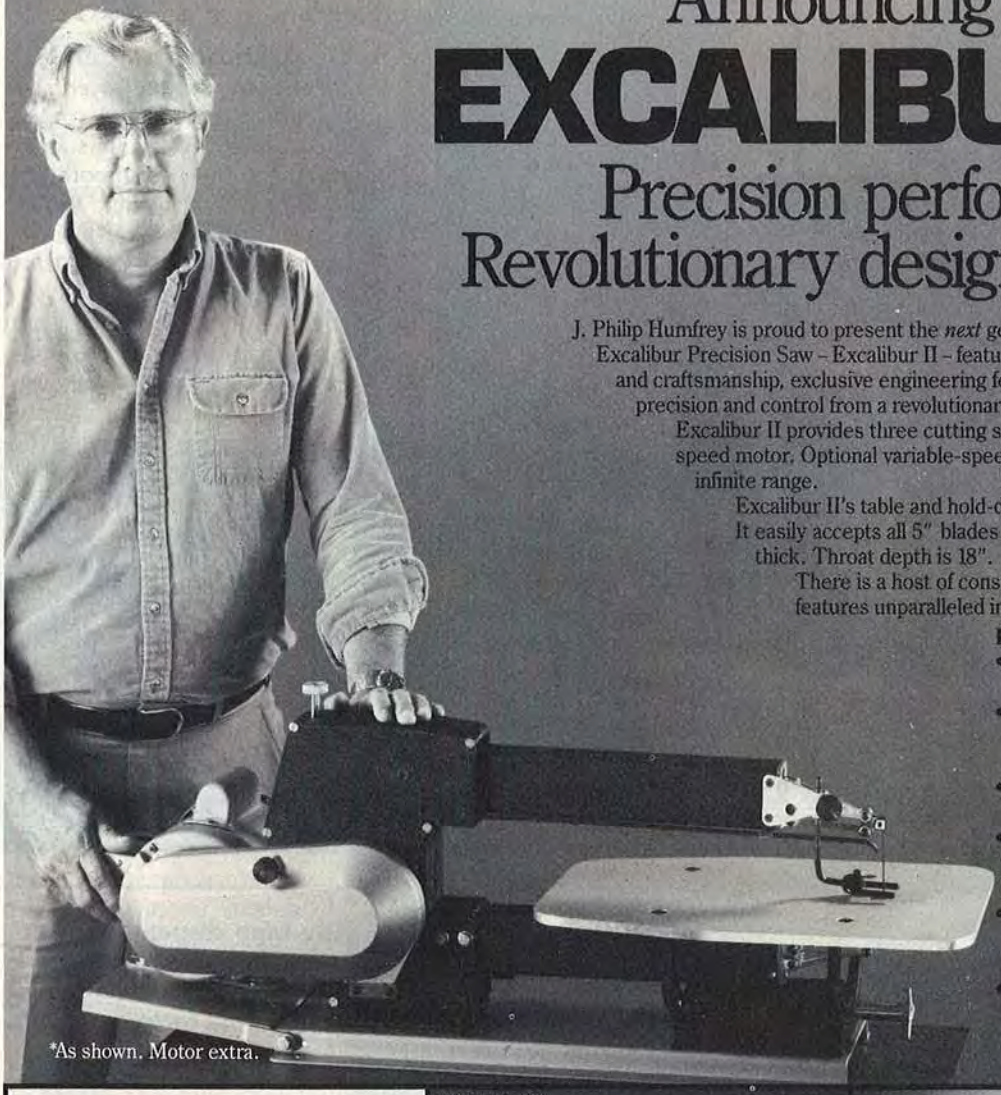

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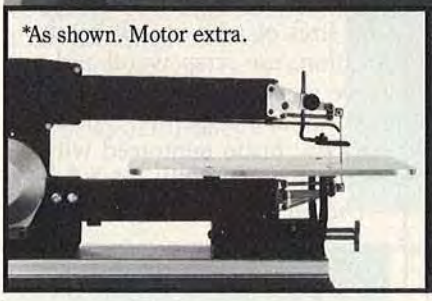

*As shown. Motor extra.

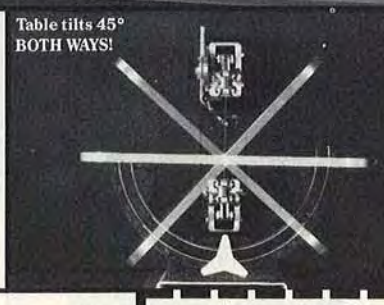

Table tilts 45° BOTH WAYS!

Precision-cast alloy components give best performance

For more information on the Excalibur II, the next generation in precision saws, call toll-free **1-800-387-9789**.
Or, mail this convenient coupon.

Excalibur II. Designed and manufactured for the woodworking craftsman who demands the best.

*Introductory price. US funds

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☐ Please rush complete information on the exciting new Excalibur II.

☐ Please rush complete information on the Original Excalibur 24 Scroll Saw

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. . . from The Renovator's Supply. For our full-color catalog of old-style and classic fixtures for the home, send $2 to **3423** Renovator's Old Mill, Millers Falls, MA 01349.

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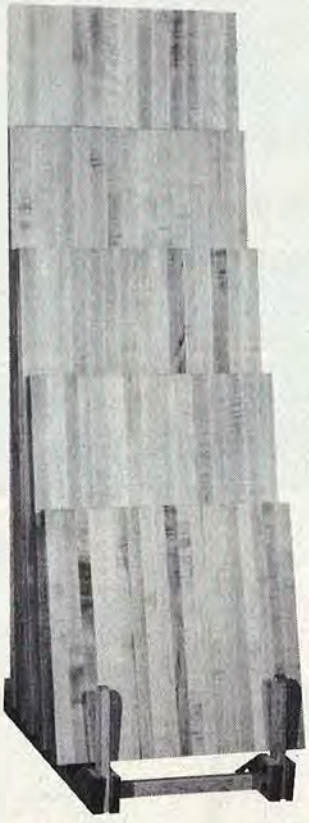
Solid Butcher Block Tops

John Boos & Co. has been in the business of manufacturing Butcher Block since 1887. We know what it takes to build a fine product. All John Boos Butcher Block Tops are solid Hard Rock Maple or Appalachian Red Oak. They make great counter tops, work benches, cart tops, occasional tables and can be used anywhere in the home.

To purchase the very best in Butcher Block Tops, write for the John Boos dealer nearest you.



John Boos & Co.

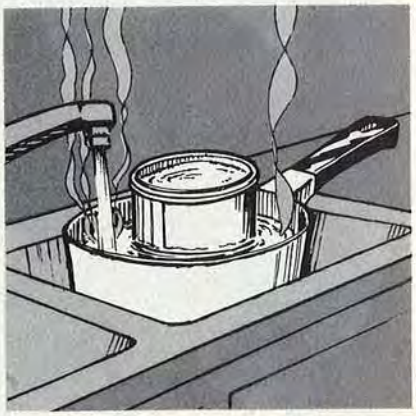
315 South First Street • Effingham, Illinois 62401 • 217-347-7701

TIPS FROM YOUR SHOP (AND OURS)

Continued from page 36

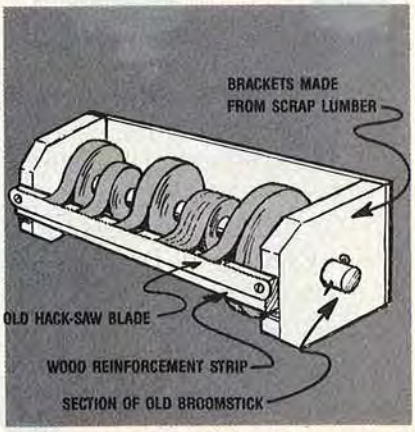
Applying finishes smoothly

Uniform coats are the exception rather than the rule with some finishes. To apply lacquers and polyurethane finishes smoothly, fill a pan with hot tap water, and set the can of finish in it for a few minutes before use. Raising the material's temperature by only a few degrees—and choosing a polyurethane foam brush as an applicator—will help avoid an uneven look when the finish dries.



Handy tape dispenser

In many shops, finding the right tape at the right time can be a problem. Once located, it's often covered with sawdust and wood shavings. To keep various types and sizes of tape in one handy location, use scrap wood and a piece of dowel or broomstick to make a tape dispenser. An old hacksaw blade reinforced with a wooden strip makes a good cutter. *—Dwight Blakeney, Seaford, Del.*



Continued on page 41

BUILD YOUR OWN Router Table

Now you can get the most out of your router by mounting it to this shop-tested router table.

The first time you try this shop-tested router table, you'll agree it adds a whole new dimension to what a router can do for you.

The *Woodsmith* router table is designed to fit any router, and has features you'd expect only on professional models.

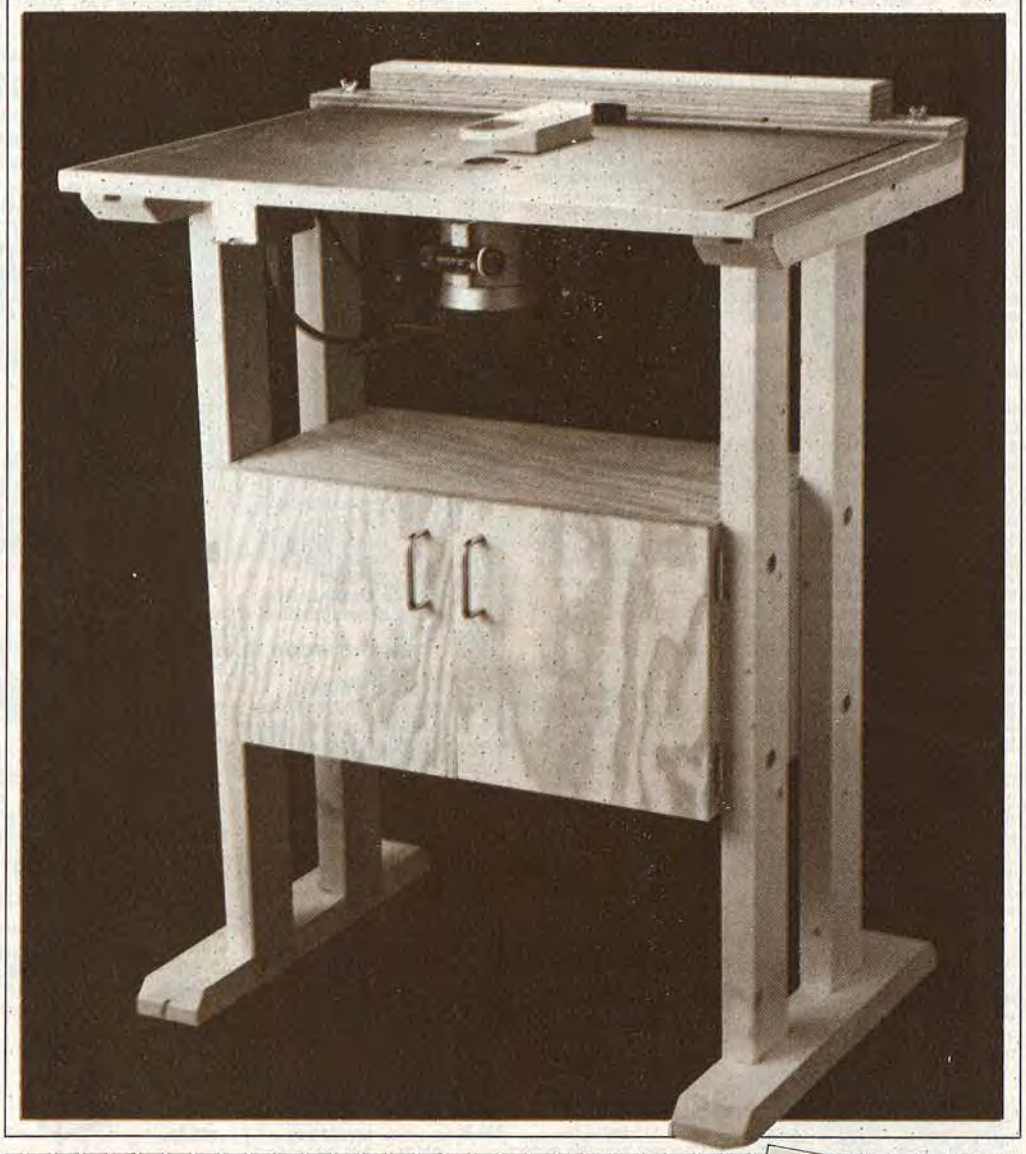
Professional Features

The extra-large table provides a steady work surface for both large and small pieces. It also has a fully-adjustable fence that lets you make cuts exactly where you want them. And with the router mounted under the table, you can easily make molding cuts on narrow or curved boards, or make multiple cuts for special effects.

Send for exclusive step-by-step plans.

The plans for this router table are now available in a six-page plan booklet that shows how easy it is to build a full-size floor model with storage cabinet (shown in photo), or a portable bench-top model.

For a limited time, the Router Table plan booklet is only $1. Send to:
Woodsmith Dept. 60,
Box 842, Des Moines,
Iowa 50304.



Woodsmith® PLAN BOOKLET

Yes, send me the *Woodsmith* Router Table plan booklet — complete step-by-step directions for building a full-size and bench-top router table.

60

Name

Address

City State ZIP

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Free with any order:
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All Freud router bits on sale

New! Freud tool sets

4 Pc.	Chisel Sets	$ 26.75
6 Pc.	Chisel Sets	33.95
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12 Pc.	Carving Set	117.50

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If another prepaid price is lower, we match the price and give you a gift certificate worth $5.00 when purchasing from our catalog. Few restrictions apply. **Minimum Order $15.00**

Freight prepaid in all U.S.A. on orders of $35.00 or more.

Note: Under 35.00 add $2.00 per order. Extra charge to Alaska & Hawaii on stationary machines. Misprints are subject to correction. This ad expires February 28, 1985. Watch for our next ad.

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Examine any item in your home or shop. If it's not what you expected, return it in original condition for a full refund.

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1100	3¾" Planer Kit	$164.75
1805B	6⅛" Planer Kit	278.95
1900BW	3¼" Planer w/cs	97.95
2030	12" Planer/Jointer	1295.00
2040	15⅝" Planer	1195.00
2400BW	10" Miter Saw w/bld	259.50
2401BW	10"Miter Saw w/ blade w/electric brake	226.00
2708	Table Saw	249.95
3601B	Router	128.95
3608BK	Router w/case	85.95
3612BR	3 H.P. Router	189.95
3700B	Laminate Trimmer	84.25
4200N	4⅜" Circular Saw	94.50
4301BV	Vr Sp Orbital Jig Saw	129.95
5007NB	7¼" Circular Saw	103.95
5008NB	8¼" Circular Saw	105.00
5012B	12" Chain Saw	119.95
5081DW	3⅜" Cord. Saw	110.40
5201NA	10¼" Circular Saw	226.50
5402A	16" Circular Saw	395.00
6000R	Uni-Drill	106.00
6010D	⅜" Cordless Drill	79.95
6010DL	Cordless Drill w/charger light & case	99.50
6010DWK	Cordless Drill w/charger & case	88.75
6012HDW	Cord. Drill Kit 2-Sp.	105.95
6013BR	½" Reversible Drill	119.00
6300LR	½" Angle Drill	152.20
6510LVR	⅜"Drill-Rev.	69.00
6710DW	Cord. Screwdriver	107.10
6800DBV	Drywall Screwdriver	97.50
9030	1⅛"x21" Belt Sndr	123.50
9035	Finishing Sander	49.95
9045B	Finishinng Sander	99.50
9045N	Dustless Sander	112.50
9207SPB	7" Sander Polisher	136.95
9401	4"x24"Belt Sander	171.95
9501BKIT	4"Sander Grinder Kit	85.75
9900B	3"x21"Belt Sander	125.50
9924DB	3"x24"Belt Sander	132.75
BO4510	Finishing Sander	46.95
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GV5000	Disc Sander	49.95
HP1030	Hammer Drill	105.00
JG1600	Jig Saw Single Sp.	91.25
JR3000V	Recipro Saw	134.75
JR3000W	2 Sp. Reciprosaw Kit	124.75

PONY CLAMP FIXTURES

		Each	Pkg 6
No. 50	¾"Pipe Clamp	$7.70	6.95 ea
No. 52	½"Pipe Clamp	6.90	6.40 ea
No. 1215	(WEB) 15"	6.40	5.80 ea
No. 7456	Clamp Pads	2.50	2.25 ea

JORGENSEN BAR CLAMPS (Heavy Duty)

		Each	Pkg. 6
No. 7224	24"	17.30	15.70 ea
No. 7230	30"	18.10	16.45 ea
No. 7236	36"	18.70	16.95 ea
No. 7248	48"	20.75	18.70 ea
No. 7260	60"	22.65	20.55 ea
No. 7272	72"	24.55	22.25 ea
No. 7284	84"	26.55	24.10 ea

JORGENSEN CLAMPS (Med Duty)

No. 3712	12"	5.90	5.35 ea
No. 3724	24"	7.30	6.60 ea
No. 3736	36"	8.90	8.00 ea

JORGENSEN HAND SCREWS

No. 3/0	3"	$9.30	$8.40 ea
No. 0	4½"	9.90	8.95 ea
No. 1	6"	11.30	10.15 ea
No. 2	8½"	13.45	12.15 ea

JORGENSON BAR CLAMPS (5"reach)

No. 4512	12" Open	17.05	15.35 ea
No. 4524	24" Open	19.05	17.15 ea
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No. 3325	3 Way Edging	$5.40	4.90 ea
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No 3202HT	2" Spring	2.15	1.90 ea

9X11 Non-Loading Silicon Carbide

Grit	A WEIGHT	Pack of 100
400, 360, 320, 280, 240		
220, 180, 150, 120		$19.60

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B7100	3x24 Belt Sander	148.50
B7200A	4x24 Belt Sander	167.90
D1010	⅜" Var. Sp. Drill	89.50
D1015A	⅜" Screwdriver/ Drill	111.95
D131O	½" Drill	89.95
D132OR	2 Sp. ½" Rev. Drill	99.95
E3800A	Drywall Screwdriver	77.95
JS-60	Jig Saw	99.95
JSE-60	Electronic Jigsaw	125.90
L-120U	3½" Planer	81.25
L1323ALS	3¼ Planer	129.95
LS-35	Finishing Sander	46.95
L-580	6⅛" Planer	189.00
R-150	1 HP Plunge Router	88.00
R-330	2 H.P. Router	139.70
R-500	3 HP Plunge Router	165.00
RA-2500	10" Radial Saw	449.95
S500A	3x5½ Finishing Sander	43.95
SU-6200	Finishing Sander ½ Sheet	89.50
TR-30	Laminate Trimmer	78.95
TS-251U	10" Miter Saw	189.95
TS-251U	w/ Accessories	199.95
W630	7¼" Circular Saw	99.50
W730	8¼" Circular Saw	109.75

MILWAUKEE TOOLS

0228-1	⅜" VSR Drill	$ 99.95
0234-1	½" VSR Drill	108.50
0375-1	¾"Rev. Angle Drill	118.50
1107-1	½"VSR D Handle	147.50
1660-1	½" SSR Compact	174.65
5397	Hammer Drill Kit	177.50
5660	1½ HP Router	162.00
5680	2 HP Router	208.50
5935	4"x24" Sander	219.95
6014	½ Sheet sander	105.00
6145	4½" Angle Grinder	107.50
6255	VR.Sp.Jigsaw	149.95
6287	H.D. Jigsaw Kit	225.00
6367	7¼" Circular Saw	119.95
6460	10¼" Circular Saw	229.00
6507	Sawzall w/case	119.50
6543-1	¼" Screwdriver	137.50
6749-1	Magnum Screwdriver	123.50
6750-1	H.D. Drywall screwdriver	96.50
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Carbide Tipped 12" = 1" Bore

No.	Size	Teeth	Use	Price
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LU73M10	10"	60	Cut-Off	38.00
LU73M12	12"	72	Cut-Off	76.90
LU78M10	10"	80	Plastic	83.50
LU82M10	10"	60	Cut-Off	44.00
LU82M12	12"	72	Cut-Off	85.95
LU84M10	10"	40	Comb.	36.00
LU84M11	10"	50	Comb.	38.00
LU85M10	10"	80	Cut-Off	67.00
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TR100	3 blades & dado set			264.95
DS306	6" Dado			98.95
DS308	8" Dado			119.50

SUN GOLD SANDING SHEETS

9x11 Aluminum Oxide C Weight

Grit	Pk of 100
150, 120, 100	$21.95
80	23.70
60	28.90
50	32.05
40	38.30

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1165	⅜" Angle Drill	$119.50
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1575	⅜" VSR Scrudrill®	119.50
1940	⅜" Cordless Drill w/98060 Charger	118.50
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2034	Drywall Screwdriver	91.50
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3034	7¼" Circular Saw	118.65
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3051	7¼" Wormdrive Saw	158.25
3091	10" Miter Saw	189.95
3103	2 Sp. Cut Sawkit	99.95
3105	Var. Sp. Cut Sawkit	109.50
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3310	1½ H.P. Router	139.50
3330	1 H.P. Router	99.95
3370-10	3¼" Planer	129.95
4010	Palm Sander	48.95
4018	½ Sheet Sander	99.50
4247	4½" Disc Sander/Grinder	69.95
4260	Power File	189.50
6750	Heat Gun	69.75

Watco Danish Oil
Natural, Medium, Dark, Black or Colors
$5.70 Qt. $17.65 Gal

TITEBOND WOOD GLUE
$5.75 Qt. $12.95 Gal

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B600-A	14½" Band Saw	$1554.00
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C10FA	10" Miter Saw	279.00
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D10V	⅜" Var Sp Rev Drill	74.95
D13V	½" Var. Sp. Rev. Drill	99.75
F-20A	3¼" Planer	99.75
F1000A	Planer/Jointer	1375.00
JH-60A	Jig Saw	103.50
P50	6⅝" Planer	295.00
P100F	12" Planer	1095.00
PSM-7	7¼" Circular Saw	114.95
PSM8	8" Circular Saw	141.90
SB-110	4x24 Belt Sander w/dust bag	183.00
SO-110A	½ Sheet Sander w/dust bag	119.95
SB-75	3x21 Belt sander-2 Sp. w/dust bag	134.75
SB8T	3x24 Belt sander 2-Sp w/dust bag	149.95
TR-6	Laminate Trimmer	92.25
TR-8	1 H.P. Plunge Router	126.95
TR-12	3 H.P. Plunge Router	194.75
W6V	Screwdriver	94.50

SUNGOLD X-WEIGHT SANDING BELTS

Sold in packs Outlasts regular belts 2 to 1 of 10 only

Size	Grit	10 Belts	
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	80	1.00 ea	.86 ea
Assortment of 10	60	1.05 ea	.92 ea
$15.95	50	1.07 ea	.94 ea
	40	1.10 ea	.96 ea
3"x24"	120	100	1.20 ea .93 ea
	80	1.22 ea	.97 ea
Assortment of 10	60	1.26 ea	1.12 ea
16.95	50	1.31 ea	1.15 ea
	40	1.34 ea	1.18 ea
4"x24"	120	100	1.68 ea 1.46 ea
	80	1.73 ea	1.51 ea
Assortment of 10	60	1.78 ea	1.64 ea
21.95	50	1.85 ea	1.70 ea
	40	1.89 ea	1.76 ea

Makita Table Saw 2708 $249.95

Makita 4x24 Belt Sander $171.95

Makita 12" Planer-Jointer 2030 $1295.00

Hitachi 14½" Bandsaw B-600A $ 1554.00

Hitachi Planer-Jointer F1000A $1375.00

Makita Planer 2040 15-5/8" $1195.00

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Rockwell 10" Contractors Saw $725.00

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IT'S BACK!

Makita ½" Blade Sharpener

Makita 16" 3 H.P. Plunge Router $119.95

Circular Saw 3612BR $189.95 5402A $395.00

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NEW!

NEW!

Makita Palm Sander BO4510 $46.95

Makita 6" Round Palm Sander BO4530 $52.95

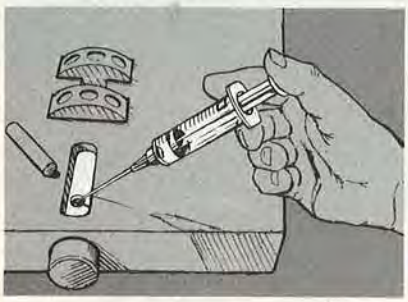
Makita 8¼" Circular Saw 5008NB $105.00

TIPS FROM YOUR SHOP (AND OURS)

Continued from page 38

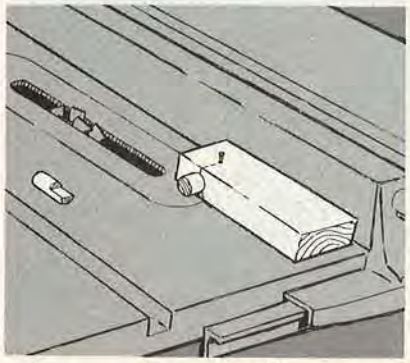
Rx for difficult gluing

Getting the right amount of glue into hard-to-reach spots is a messy operation. To inject glue with "pin-point" accuracy, use a medical syringe with an 18- or 22-gauge needle. Keep the apparatus from seizing up after use by flushing the syringe and needle with warm water and storing them in a closed container of water.
—Styles Sass, Grafton, N.Dak.



Working with dowels

A dowel's shape is both a blessing—it makes the material a remarkably versatile woodworking resource—and a curse: working a cylindrical object can be frustrating. This handy jig, a scrap 2×4 with a hole the diameter of the dowel bored through it, makes dadoing, trimming to length, or decreasing the diameter of a dowel a safe and simple procedure on your radial-arm or table saw. Drive a finish nail through the 2×4 and just far enough into the dowel to prevent it from turning. (This tip works well on the bench dogs for the quick-clamp vise featured in this issue of WOOD—see page 88.)



Continued on page 42

Our catalog doesn't just sell you things. It teaches you things. The Garrett Wade Catalog is a new, 212-page collection of woodworking hand tools, machinery, finishing supplies and accessories that are simply the finest available. Anywhere.

And besides offering quality tools from around the world, we also give you a lot of quality advice. On woodworking techniques. On picking the proper tool for a particular job. On finishing, sharpening, clamping and more.

The catalog is filled with superb photography, honest specifications and reliable descriptions. It's neatly divided into seventeen sections, including a section on our Swiss INJECTA INCA power tools. And throughout the year, our catalog owners will receive several handy supplements–*free of charge.*

Just send in the coupon below with $3.00, and we'll send out your copy of the 1985 Garrett Wade Catalog. It just may prove to be the most useful tool you own.

Garrett Wade Co., Dept. 233
161 Avenue of the Americas
New York, N.Y. 10013
Gentlemen:
Send your complete 212-page catalog of woodworking tools, machinery, and accessories. Enclosed is $3.
☐ I would like *only* the following sections of the catalog, for 50¢ each:
☐ INJECTA INCA ☐ Carving ☐ Finishing
Enclosed is $_____
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State_____ Zip_____

Shophelper™

Safety Guides

U.S. PAT. #3-738-403

Anti-Kickback Stock Feeder

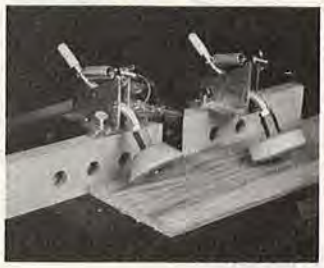
SAVE TIME! SAVE MATERIAL!
LIKE HAVING AN EXTRA PAIR OF HANDS!

Keep your fingers *away from cutters. Let Safety Guides hold your work. Use your hands to feed and control the operation. Push stock through Safety Guides with a follow board.*

WORK WITH CONTROL!
Safety Guides provide control, stability, and smoothness in ripping and cutting operations. It helps eliminate uneven cuts binding and chatter of material when hand feeding power machinery.

WORK WITH CONFIDENCE!
The spring loaded SINGLE DIRECTION BALL BEARING WHEELS will not reverse, the hard composition wheels hold work down and against the fence without maring or marking.

WORK SAFELY!
SHOP HELPER Safety Guides hold work down firmly helping to assure safe handling of stock on: table saws, band saws, shapers, motorized mitre boxes, jointers, etc. *SHOP HELPER Safety Guides meet CAL-OSHA requirements as an Anti-kickback device when properly mounted and adjusted.*



$89.50
Includes: One pair of Safety Guides with long mounting brackets and hardware, instructions for use and plans for auxiliary fences.
Extra Sets of Mounting Brackets
Long Brackets: $12; Short Brackets: $8
Satisfaction Guaranteed or return within 30 days for a full refund.

SAFETY IS A MATTER OF SELF-RESPECT!

To Order: *VISA/MC Call Toll Free: 800-344-7455; California: 800-828-8833*
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TIPS FOR YOUR SHOP (AND OURS)

Continued from page 41

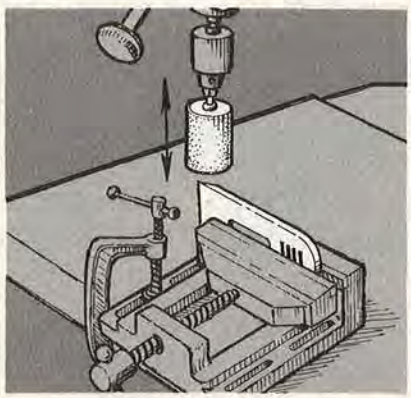
Paint brush maintenance

Your paint brush is clean but not dry. What's a good way to remove excess water or paint thinner? Hold the brush between your palms and spin it back and forth vigorously. Centrifugal force will spin away excess moisture and fluff out the bristles—which helps prevent the brush from drying into an unmanageable lump.

Sharpening with a drill press

Putting the proper bevel on chisels and plane blades isn't an easy freehand skill. Use a drill press and drum-sander attachment with appropriate grit sleeves to grind blades. Clamp the blade or chisel in a drill-press vise with the blade perpendicular to the table and parallel to the quill. Position and secure the vise to the table with a C-clamp. With the sander turning slowly, raise and lower the quill to sharpen the blade. To move the blade closer to the drum, tap the vise with a mallet. Work slowly to prevent excessive heat buildup.

—J. J. Sawyer, Pensacola, Fla. ■



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17544	Right Skew; face plate		17.95	
17545	4 PC. SET — One each of the above (Individually priced @ $71.80) Plus FREE Silicone Carbide Stone **Save $10.00**		61.80	
	High Speed Steel			
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17525*	1/2" Round Nose		7.45	
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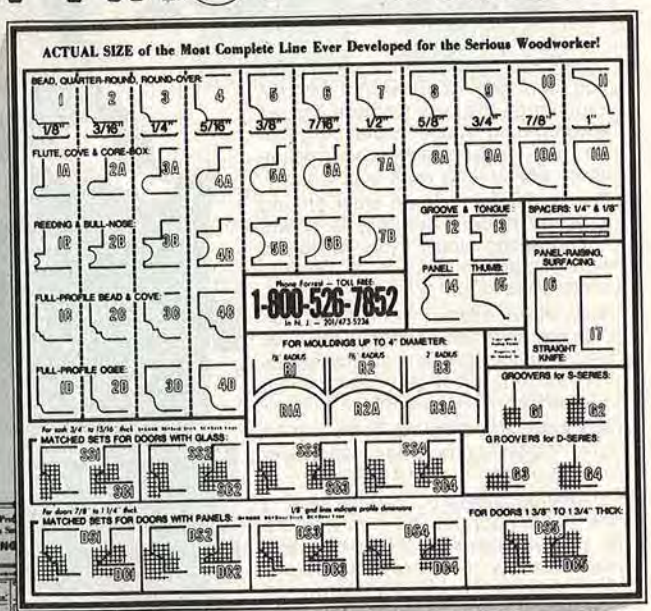

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split oak baskets

Don Yarger, student of an age-old craft

From finding a special tree nestled into a hillside to interweaving thin white oak splits, basket-making challenges the eye and hand, and rewards the craftsman with enduring creations that earn their keep.

Don Yarger, at 31, is still a few years away from becoming a "journeyman" basket maker, but he finds his apprenticeship a rewarding one. Don's work provides him, his wife, Annita; daughter, Jennifer; and son, Cody, with a comfortable home in Protem,

Continued

a small Missouri Ozark town just a few miles from Silver Dollar City where Yarger makes his living weaving and selling split-oak baskets.

Early baskets were crafted from many common materials — cattail leaves, reed, willow, and tree bark. But the most easily made, most durable designs were made from thin, flexible strips of green sapwood from ash, hickory, and best of all, white oak trees. In fact, one species of white oak peels so easily into splits that it's referred to as "basket oak."

Hunting the Basket Tree

Like wood-frame homes and table tops, baskets begin with trees, and Yarger knows that just any old tree won't do. He prefers white oak but has also used walnut and hickory for his baskets.

His search for the perfect white oak begins on the northeast slopes of Ozark hillsides. According to Yarger, there are three reasons to select a tree from a northeast slope. First, because the wind normally blows from southwest to northeast, the trees on a sheltered northeast slope tend not to be twisted. Also, the wood isn't dried out and brittle from too much sunshine. And third, since ground moisture remains longer on these slopes, the trees absorb and retain moisture so their wood tends to stay workable.

Finding the area is only the beginning. Next comes selecting the perfect tree—about 10 inches in diameter, free of branches for about the first 10 feet (to eliminate knots), and straight-grained.

How can Don tell if a standing tree is straight-grained? His trained eyes can spot a good tree a long way off: "I can tell how it's going to split by the way the bark looks. If it runs pretty much straight up and down the tree, it's going to be straight-grained and come apart pretty well," Yarger explains.

Ideally, Don looks for a tree that will yield a 5- to 6-foot log from the base to below the lowest limb —the moistest part of the tree.

Laying Out, Halving, and Splitting the Log

After felling the tree with a cut as close to the ground as possible, and freeing the desired section from the rest of the trunk, Yarger studies the wood for halving and splitting.

"I look for knots when I lay it out on the ground," he says. "If there is a knot, I make the first split close to it, since that section will be lost anyway. I split down from the top of the log to the base. That way, if there's a knot in there somewhere, the split has a tendency to cut right through it. But I've found that if you run into a knot when splitting from bottom to top, the split usually runs around the knot and maybe even slabs off."

Using a maul and steel wedge, the basket maker splits the log in half. Then he moves one third of the way down each section, where he drives in the maul to quarter the log. This way, Don knows he's right in the run of the grain, since the true grain can't be seen from the ends of a section.

After the log has been quartered, he crosscuts it into about 3-foot sections, then slabs off the heartwood, which, if it is relatively knot-free, he uses later for handles, ribs, and accent strips. Then, Yarger splits the quartered sections into eighths, called *billets*.

Making billets

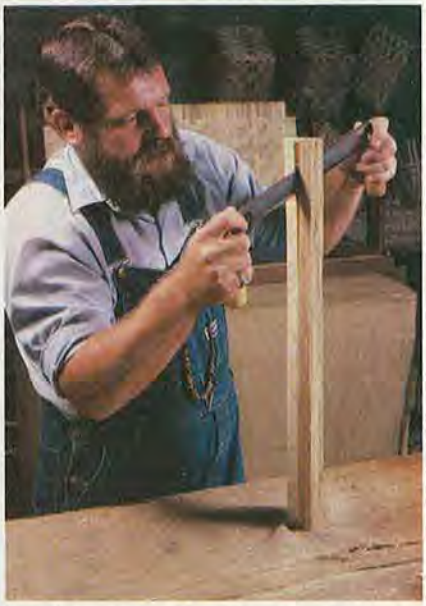
"In summer, the green, felled log must be split within ten days, or the ends will dry out and check," Don says. "In winter, though, splitting can be done as long as four months after the tree has been dropped."

From Billet to Split

Don begins the process of turning billets into splits by taking off the bark with a drawknife at the shaving horse.

Removing the bark

Next, the individual billets are shaped to desired form, also on the shaving horse. "The object," explains Don, "is to taper each end of the billet so that when strips come off, they'll be wide in the center for



Splitting the billet with a drawknife

the bottom of the basket, and they'll taper toward their ends to form the basket's *ribs*."

Don does this shaping with the drawknife, turning the billet to work it from both ends. He uses the same method to form *weavers*, the long, narrow, and straight pieces that tie the ribs together. He depends on a well-developed eye to maintain widths.

Traditionally, from the shaving horse, billets would move to the workbench to be split into weavers or ribs with a drawknife and a simple jackknife. Standing a billet on end, the basket maker would split it with the drawknife down its length parallel to the annual growth rings. He would keep splitting until the pieces could no longer be reduced by that method, then switch to the jackknife. Don knows the old way, too.

Placing the blade of the jackknife in the grain, Don begins the split. When the knife has separated enough of the wood to grasp by

Pulling the split by hand

hand, it's put aside, and the pulling begins.

Hand-pulling becomes increasingly delicate as the strips near their final thickness. "If the split runs off to one side, you pull toward the other side," he says while demonstrating.

Final hand-pulling

That's the traditional way, but in the high production basket shop, the traditional takes too long. Instead of hand-pulling, Don has fitted a cooper's spokeshave with a planer blade to shave weavers and ribs from the billets clamped on a shaving horse.

Shaving a split with a spokeshave

It's still hand work, and the results aren't always uniform. According to Don, "anything done by hand is going to have some variation on it."

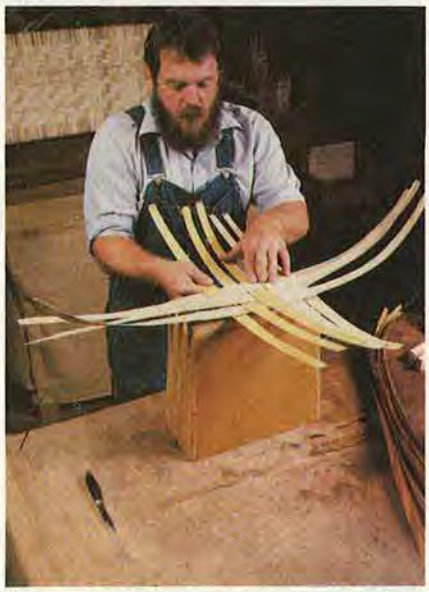
With no gauge to rely on, the shaving technique requires a practiced eye. "The thickness of the split is solely a product of how hard the spokeshave is pushed down and the strength of the maker's pull," Don says.

He makes his splits "down the tree" with the spokeshave and then works the tool back and forth following the grain and keeping it to the center. "The strips must be constant in their thickness, with ribs thicker and weavers thinner. If they're thick on the ends and thin in the middle, the basket will have a weakness," Don explains.

The splits come off the shaving horse moist and pliable, ready for weaving. They'll stay that way for 3 to 4 days in normal weather, but hot days dry them out in an hour. That's when Don wets the splits down with a sprinkling can or gives them a good soaking.

Two Types of Baskets in 50 Styles

To this basket maker, the world of split-oak baskets is divided into two parts—designs woven over a form and those built completely freehand. Yarger makes both, in 50 different styles. Starting below, we'll follow him through the steps in making a formed, rectangular basket that's a popular seller.

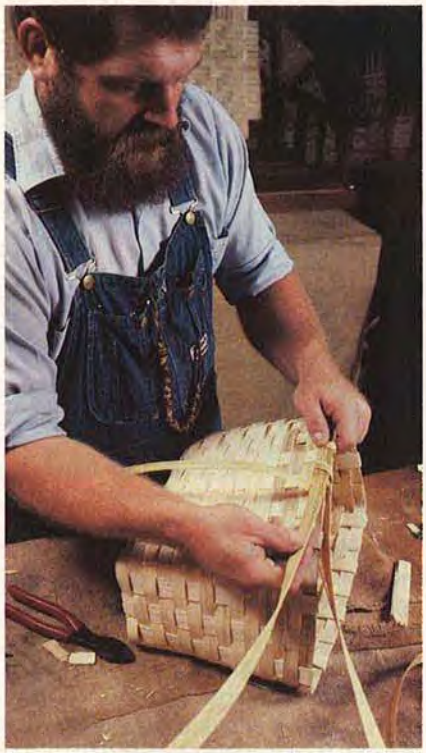


1 Don begins by laying rib splits across the plywood box, then interweaves the side rib splits with the end rib splits. The interwoven ribs become the basket's bottom. They're tightened later in the process. So they'll bend over the form, Don wets the ribs.

Continued

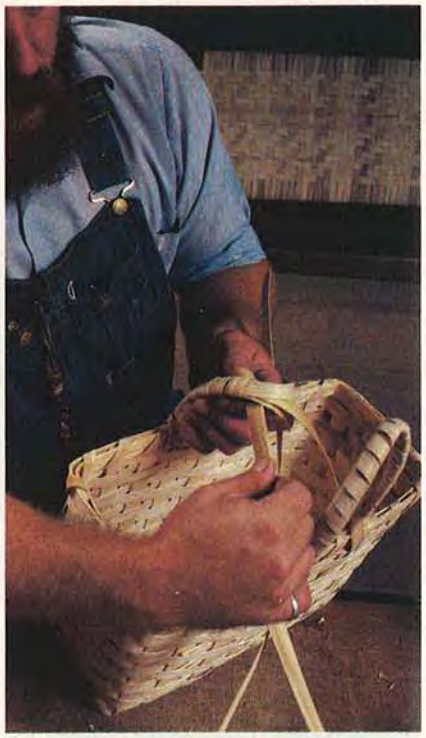
2 Weavers gradually build up the sides. The "over-one, under-one" is the "checker" pattern. A band holds the weave.

3 Don angle-clips the ribs so they'll tuck under the inside weavers. A thin-bladed knife helps to lift weavers slightly.

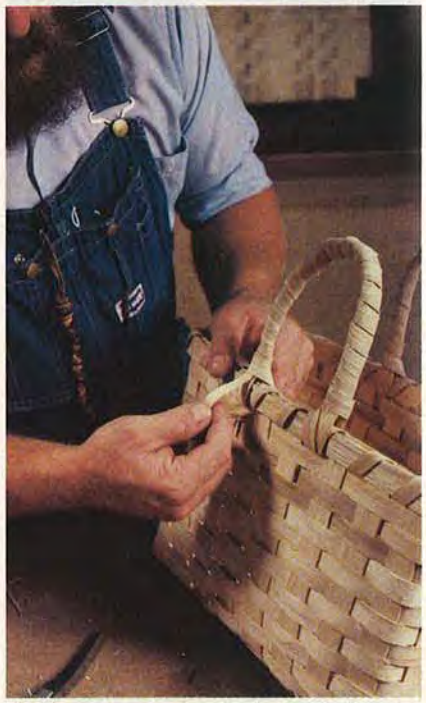


4 To add strength, Don uses two weavers at once, and binds them to the top of the basket with a lashing of narrow splits (weavers cut lengthwise).

5 Finishing the basket border, he uses a knife blade to tuck the lashing under a split after pulling it tight. Tucks are inside.



6 Doubled splits bound twice with thinner weavers make strong handles. Don spaces them between the ribs of both basket sides and lashes them.



7 The last tuck of the handle goes under the border splits. Don believes both basket and handle must be equally sturdy.

MAPLE
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Paul L. McClure

Wood technologist; lecturer; owner of Wood World, a retail hardwood store in Tempe, Arizona; woodworking instructor, and former exotic hardwood buyer.

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Sugar maple

Probably our most useful domestic hardwood, maple produces syrup for pancakes, school desks to scribble on . . . and much more in between.

Brief history

During the 1700s, a cabinetmaker named Rock manufactured "Rock's Hard Maple Furniture." The name stuck, and the terms "rock maple" and "rock-hard maple" remain popular today.

For generations, in fact, hard maple has been used for furniture and other items that take abuse: desks, workbenches and butcher blocks, for example.

Wood identification

Twenty-three species of maple grow in Canada and the U.S. They form two broad commercial groups: soft maple and hard, or "sugar," maple—which is tapped each spring for its sap.

Hard maple flourishes west and south from southeastern Canada and Maine to Minnesota, Missouri, and Alabama. The largest quantities of hard maple are found around the Great Lakes, and Michigan and New York produce the most trees in this country. Soft maple follows the same range, but grows in damper ground—lowlands, swamps, and stream banks.

Maple sapwood has a clean, white appearance, is free from defects and is typically 3" to 5" thick. These qualities make it more valuable than heartwood, which is uniform in color and runs from light reddish brown to dark brown.

Generally straight-grained with a consistent texture, maple also can have a bird's-eye or curly (also called fiddleback) pattern. Many woodworkers find the unique grain patterns of maple burl particularly appealing.

Soft maple, although similar in appearance to hard maple, produces lighter wood with more pronounced grain. Although not as tough, stiff, or heavy as hard maple, soft maple tends to resist warping and twisting better. Its color ranges from pale brown to almost white with brown streaks.

Working properties

Hard maple remains strong when bent, absorbs shock well, works nicely with both power and hand tools, and resists wear. It also turns well and requires no filling before finishing. Hard maple takes a high polish and has substantial screw-holding power.

Soft maple works even more easily than hard maple. It glues, stains, and finishes well but doesn't take as high a polish as hard maple.

Uses in woodworking

Soft maple, used principally for lumber, paper pulp, and other industrial applications, continues to be suitable for cabinet frames, unseen parts of upholstered furniture, and jigs and forms used in woodworking shops.

Hard maple applications include bowling alley surfaces, chopping blocks, piano frames, turnings, furniture (particularly figured-wood pieces), ladder rungs, rulers, tool handles, even clothes pins.

Cost and availability

Hard maple comes in average lengths of 6' to 12' and average widths of 6" to 10", while soft maple trees tend to produce somewhat wider boards. Both types are widely available and can be bought as lumber, veneer, and turning blocks. Maple is a relatively inexpensive hardwood, although bird's-eye, curly, and burl varieties can be expensive. ■

Print this article

BUILD YOUR OWN wooden pulls

Whether you're dressing up existing door and drawer fronts or starting a project from scratch, these easily made wooden pulls will help you get a good—and attractive—grip on the situation.

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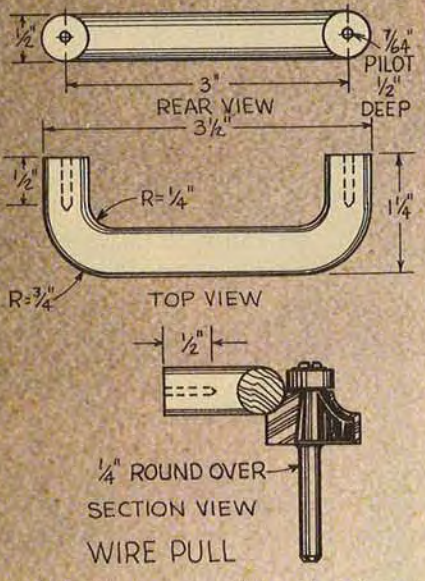
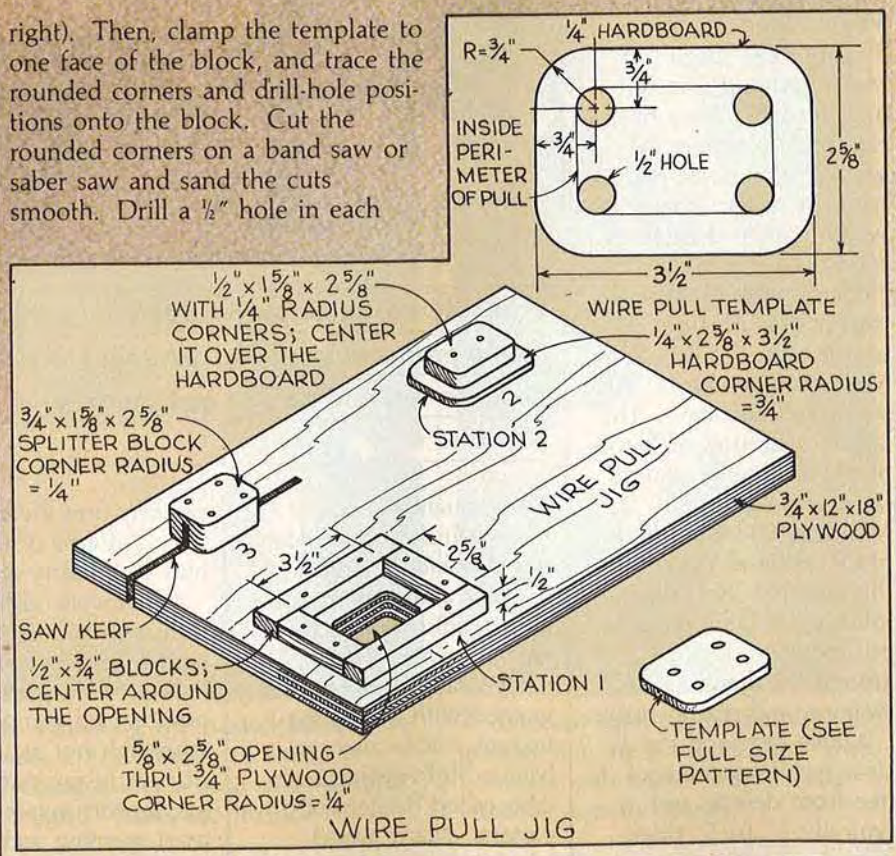
Hardwood Wire Pulls



1 Cut ½" stock to 2⅝" wide × 3½" long. Each block will yield two pulls. (Cut extra blocks: you may lose a few to machining errors.)

2 Cut the Wire Pull Template from ¼" hardboard (see the dimensions at right). Then, clamp the template to one face of the block, and trace the rounded corners and drill-hole positions onto the block. Cut the rounded corners on a band saw or saber saw and sand the cuts smooth. Drill a ½" hole in each



corner as marked. (We used a drill press and a Forstner bit for this step, since the grain can deflect a regular twist-drill bit.)

3 Mark the inside perimeter of the pull on the block. Using a band saw or saber saw, cut to the inside of the marked line to rough-out the inside of each block.

4 Construct the Wire Pull Jig as shown at left. The shape of the hole and the supports around it (Station 1), as well as the support blocks (Stations 2 and 3) must be cut and shaped accurately. Do not place any nails in the path of the saw kerf in Station 3.

5 Place each block in the first station on the jig and use a router fitted with a flush-trimming bit to trim the inside. (The ball-bearing pilot rides against the sides of the hole in the jig, cutting the block interior to its proper size.)

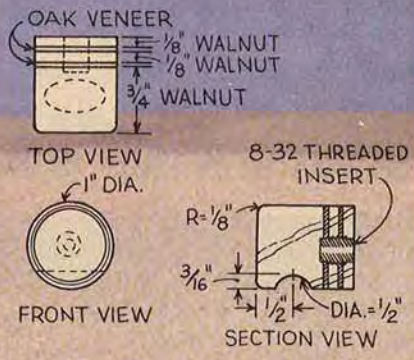
6 With the pull still in the first station, insert a ¼" round-over bit into the router. Rout the bottom and top inside edges of the pull as shown in the photo below. Move the pull to the second station and round-over the outside edges.

7 Move the pull to the third station and place the jig on a table saw. With the blade set 1⅜" above the table surface, cut the pull in two.

8 Mark the centers of the ends of each pull, and drill a 7/64" pilot hole ½" deep for a #8 mounting screw.

9 Sand by hand and apply finish.

Whistle Pull



WHISTLE PULL

1 Laminate the walnut and oak veneer in block form as shown in the top view in the Whistle Pull Drawing and the photo below.

2 Using a 1" plug cutter, cut the pulls from the block.

3 Mark the center of each pull on its back side. Clamp the pulls (one at a time) between the jaws of a

handscrew, then clamp the handscrew to a drill-press table and drill a 9/32" hole ⅜" deep to accommodate an 8-32 threaded insert. (Threaded inserts in this size were ordered from Woodcraft, 41 Atlantic Ave., Box 4000, Woburn, MA 01888. Catalog $3, and are available from other mail-order sources. You may be able to locate them locally, too.) Install the insert as shown in the drawing below, turning the drill press by hand. (Unplug your drill press before performing this procedure. We used a drill press, as inserts are very difficult to install evenly using a screwdriver.)

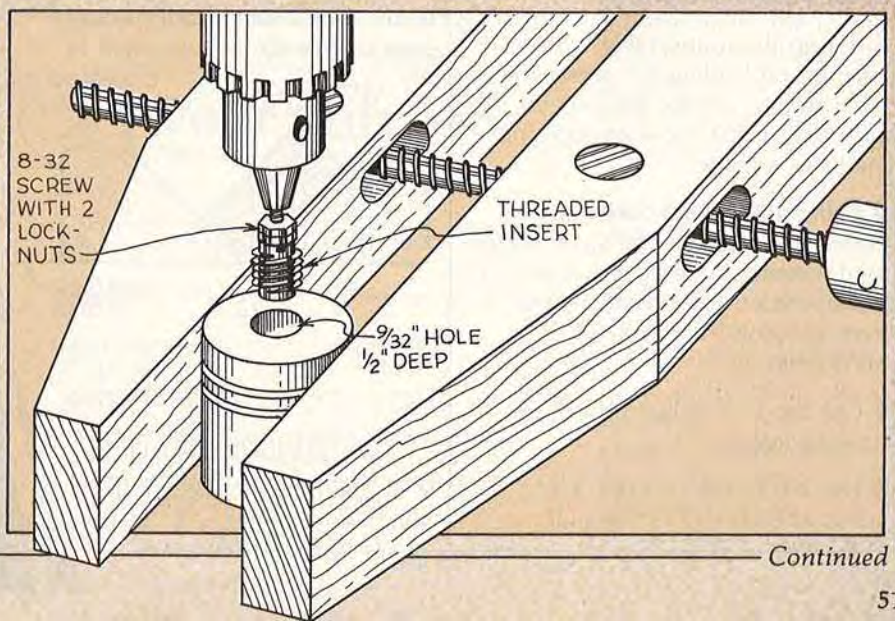
4 Use a round rasp to shape the grasp as shown in the photo below. (We clamped the pull in a vise to steady it for rasping.)

5 Round the top by sanding; hand-sand the pull and apply finish.

Hidden-Grasp Pull

1 Cut a piece of ¾" oak to ¾"×16" for four pulls.

2 Lay out the pulls by marking the oak at 3¾" intervals, leaving ⅛"



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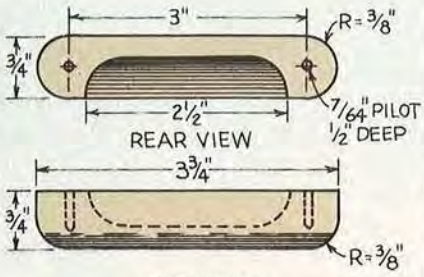
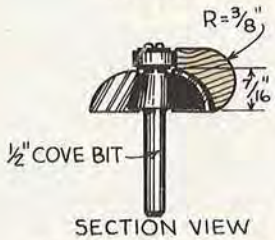
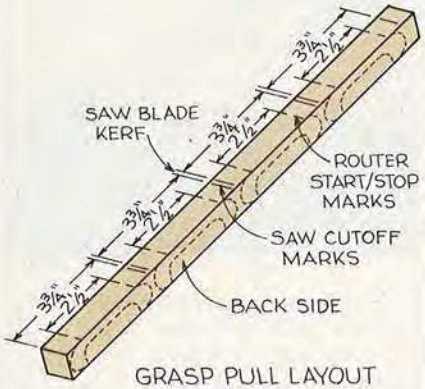
SCRAP WOOD PROJECT



TOP VIEW



SECTION VIEW
HIDDEN-GRASP PULL



GRASP PULL LAYOUT

gaps for saw kerfs as illustrated in the Grasp Pull Layout above. Mark the router start and stop marks at 2½" intervals for the hidden grasp as shown in the drawing.

3 Set up the router table with a ½" cove bit protruding 7/16" above the table surface. Make the cuts for each pull, using the start and stop marks as a guide.

4 Using a ⅜" round-over bit, rout both front edges of the piece. (We used a router table with a fence for this operation to prevent the bit from gouging the coves cut previously.)

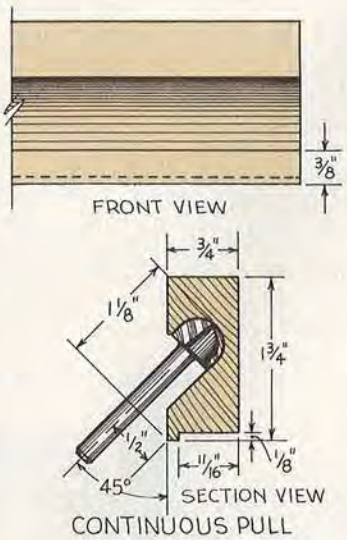
5 Cut the four pulls to their 3¾" finished length.

6 Use a compass to mark a ⅜" radius at each end of the pull. Round-over the end with a belt sander or stationary disk sander, or rasp and sand by hand.

7 Locate and mark holes for mounting screws, and drill a 7/64" pilot hole ½" deep to accommodate #8 wood screws.

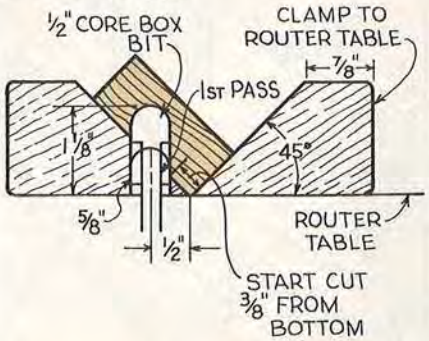
8 Hand-sand each pull and apply finish. (We chose polyurethane.)

Continuous Pulls



CONTINUOUS PULL

1 To build the Continuous Pull Jig shown below, crosscut a 2×4 (1½"×3½") to the length of your router table. Bevel-rip the 2×4 at a 45° angle as shown below, so that the shorter face of each piece is ⅞" wide. (You'll need both pieces of 2×4 for the jig.)



CONTINUOUS PULL JIG

2 In one of the pieces, drill a ⅝" hole whose center is ½" in from the angled edge and midway along the length of the block. Clamp the piece to the router table so the ⅝" hole centers over the ½" core box bit. Clamp the other half of the block to the table as shown above.

3 Rip ¾" lumber 1¾" wide and 1" longer than length of door or drawer it will be attached to.

4 Pencil a mark ⅜" from one edge on one end of the ¾" piece as shown. With the router off and the router bit set at about ½" above the table and protruding through the jig, push the marked end of the stock up next to the core box bit. The cut should start just above the penciled ⅜" mark. Start the router and push the stock over the bit to make the first pass. Raise the bit about ⅛" per pass until the full 1⅛" depth is reached.

5 "Break" the sharp edge on the pull with sandpaper. (We sanded the sharp edge by hand using 150 grit sandpaper followed by 220 grit paper attached to a sanding block.)

6 Cut an 11/16" rabbet ⅛" deep along one edge of the pull to mount it to the door or drawer. (We used a dado blade on the table saw to cut the rabbet, using push sticks to safely position the pull next to the fence and push the piece over the rotating blade.)

7 Cut the pull to the finished length. Finish-sand and varnish. Avoid varnishing the rabbeted edge that will be glued to the door edge.

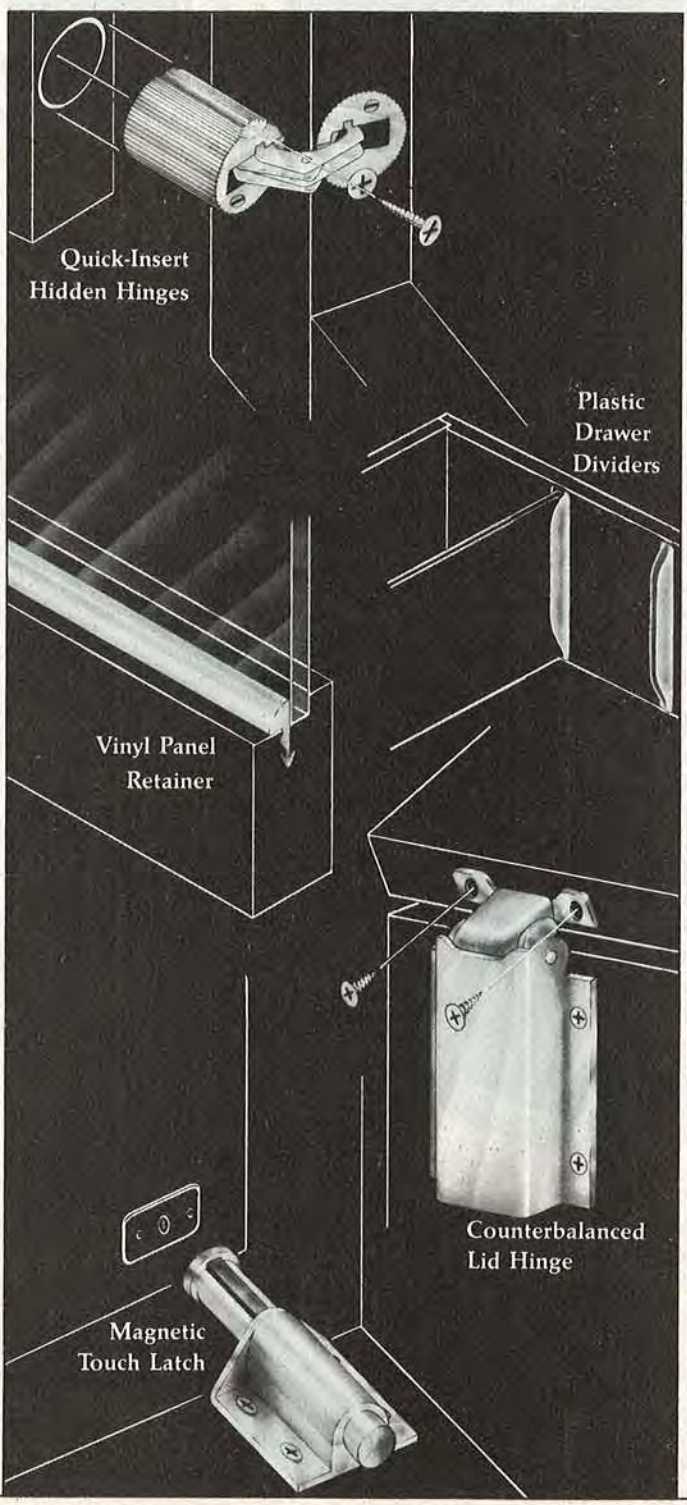
8 Glue and clamp the pull to the door edge, being careful when clamping not to mar its surface. ■

PROBLEM-SOLVING hardware

Print this article

Woodworkers who build cabinets or furniture always seem to be in need of just the right piece of hardware for one of their projects—hardware that meets a special need. Chances are good that the item you're looking for exists—but where? The products shown here represent but a few of the thousands of special-purpose hardware items available today.

It pays to know your hardware options, both at your local hardware store or home center and through mail order. For your convenience, on the next page, we list a group of mail-order firms (including The Woodworkers' Store, where we bought the items shown below) that offer selections of cabinet hardware. We think you'll find purchasing their inexpensive catalogs a good investment—and good reading, too.



Quick-Insert Hidden Hinges

Completely invisible with the door shut, and unobtrusive when its open, these hinges install easily and quickly. Just drill matching holes in the door and frame, insert the hinge into those holes, drive a single screw through each side into the wood, and you're done!

Plastic Drawer Dividers

Ideal for compartmentalizing cabinet drawers, these nifty items fasten to the inside of the drawer sides with nails. The ones shown accept dividers from ⅛" to 5/16" thick, and come in two heights—2" and 3⅛".

Vinyl Panel Retainer

With frame-and-panel doors, you've got to secure the panel somehow. While you can cut thin strips of wood to do the job, this purposeful product sure makes the going a lot easier. You can cut it easily with a knife and miter it with standard tools. The type shown snaps into a groove cut into the frame.

Counterbalanced Lid Hinge

This surface-mount, dual-purpose hardware item makes great sense for projects with lids, such as stereo cabinets and the like. Just position the lid and hinge, mark the location of the screw holes, drill starter holes, and mount the hinge. It's a snap!

Magnetic Touch Latch

Looking for a sleek-looking set of cabinets without door pulls? This catch holds the door closed until you press on the face of the door. To close the door, push the door shut and the latch holds it. This spring-loaded latch can be

Continued

mounted either horizontally or vertically.

Plastic Magnetic Catch

Especially suited for small doors, this catch mounts in a hole bored into the frame; the metal strike attaches to the door. The catch shown is available in brown and white plastic.

Ornamental Surface-Mount Hinge

Designed for ¾" flush inset doors, this hinge doesn't require mortising. The leaves of the hinge align to ensure just the right space between the door and frame.

Out-of-Sight Shelf Supports

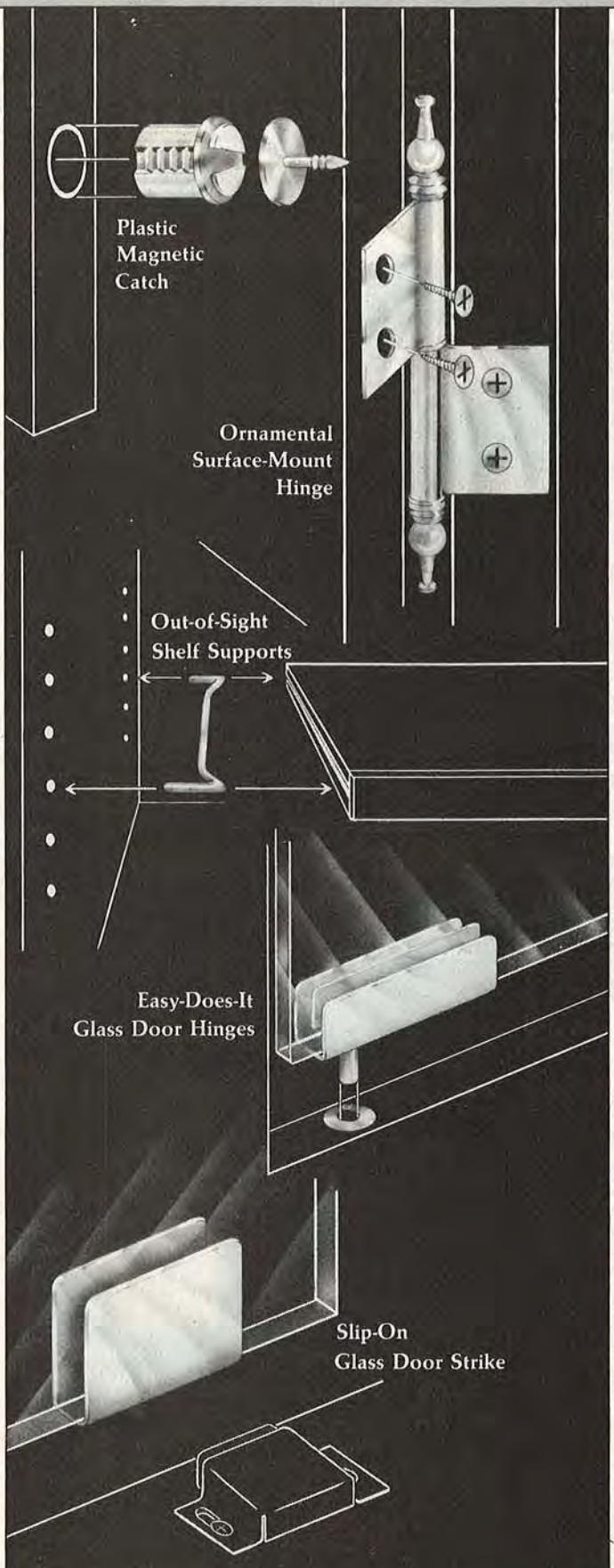
An interesting option to the more standard shelf support clips, these wire supports fit into small holes drilled in cabinet end and divider panels. Shelves with grooves cut into their edges slide onto the supports. To change shelf positions, just move the wire supports up or down.

Easy-Does-It Glass Door Hinges

Hinging glass cabinet doors can be a hassle, but not with this temper-saving piece of hardware. To install a pair of these hinges, drill holes in the top and bottom of the cabinet, fit plastic inserts into the holes, slip the hinges into the inserts, slide the glass door into the hinges, and secure the door by tightening the screws in the hinge.

Slip-On Glass Door Strike

This simple-to-install strike is the perfect match for the glass door hinges shown here. (You can also use it with the touch latch described above.) Foam rubber pads hold the strike securely in place.



Mail Order Hardware Suppliers

The companies listed below represent a good cross section of the firms selling cabinet and furniture hardware (and in many cases other items) by mail. We'll tell you about others as we run onto them.

U.S. Suppliers:

Ball and Ball
436 West Lincoln Highway
Exton, PA 19341
215/363-7330
Mini catalog: Free
108-page catalog: $5

The Brass Tree
309 North Riverside Drive
St. Charles, MO 63301
Catalog: $2

Constantine's
2054 Eastchester Road
Bronx, NY 10461
Toll free: 800/223-8087
108-page color catalog: $1

Craftsman Wood Service Co.
1735 West Cortland Court
Addison, IL 60101
148-page catalog: $1

Garrett Wade
161 Avenue of the Americas
New York, NY 10013
40-page brass hardware catalog: Free

Horton Brasses
Nooks Hill Road,
P.O. Box 120J
Cromwell, CT 06416
203/635-4400
Catalog: $2

Imported European Hardware
4295 South Arville
Las Vegas, NV 89103
702/871-0722
Catalog: $1

Continued on page 115

COLOR me safe

Children of all ages will love to keep little treasures safe and sound in this walnut safe.

Print this article

How to Make the Box

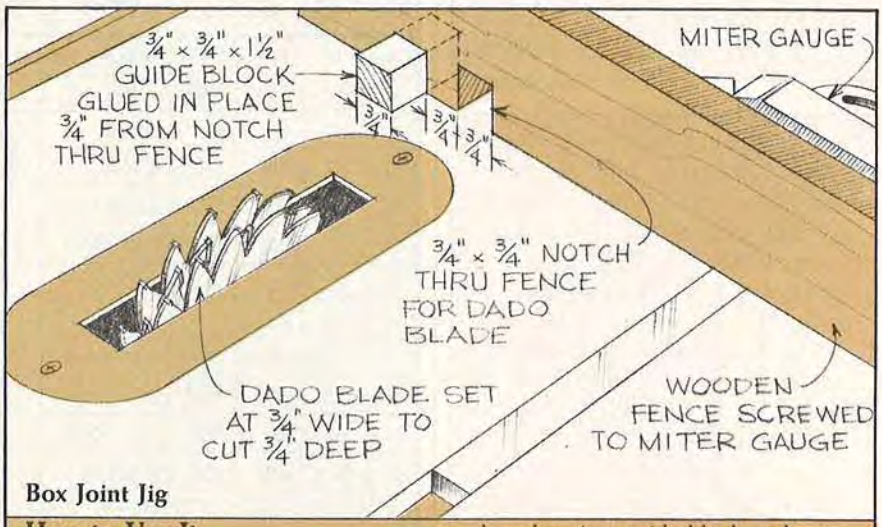
1 Rip and crosscut the box's top, bottom, and sides (A) to size.

2 Build the Box Joint Jig shown below. Then, test the jig with ¾" scrap lumber to make sure the pieces will join together properly. Cut notches in the sides and top and bottom, using the Box Joint Jig as shown. (Notice that the side pieces have a finger at the front, while the top and bottom have a ¾" space and then the first finger.)

3 Refer to the cutaway drawing for the location of the hole in the side of the safe that will accept the lock bolt. Mark its center point, then drill a 9/16" hole ⅝" deep.

4 Glue and clamp the sides to the top and bottom. Check for square with a try square. Remove excess glue from the box after the glue forms a tough skin. Round-over the four outside corners, using a belt sander or a router with a ¾" round-over bit. Cut a ¾" rabbet ⅜" deep in the back of the box with a router; square the corners of the rabbet with a chisel.

5 Before cutting the back (B), measure the rabbeted opening to ensure a good fit. Cut B to size, then cut a 1/16" rabbet ⅛" deep around the outside edge of B. Glue and clamp the back to the box with the decorative rabbet facing out.


¾" × ¾" × 1½" GUIDE BLOCK GLUED IN PLACE ¾" FROM NOTCH THRU FENCE
MITER GAUGE
¾" × ¾" NOTCH THRU FENCE FOR DADO BLADE
DADO BLADE SET AT ¾" WIDE TO CUT ¾" DEEP
WOODEN FENCE SCREWED TO MITER GAUGE

Box Joint Jig

How to Use It

1. A) *For top and bottom:* Clamp board to fence so front edge is ¾" from guide block; cut first notch
   B) *For sides:* Place front edge of board against guide block and cut first notch
2. Place notch over guide block and cut second notch
3. Repeat until all notches are cut

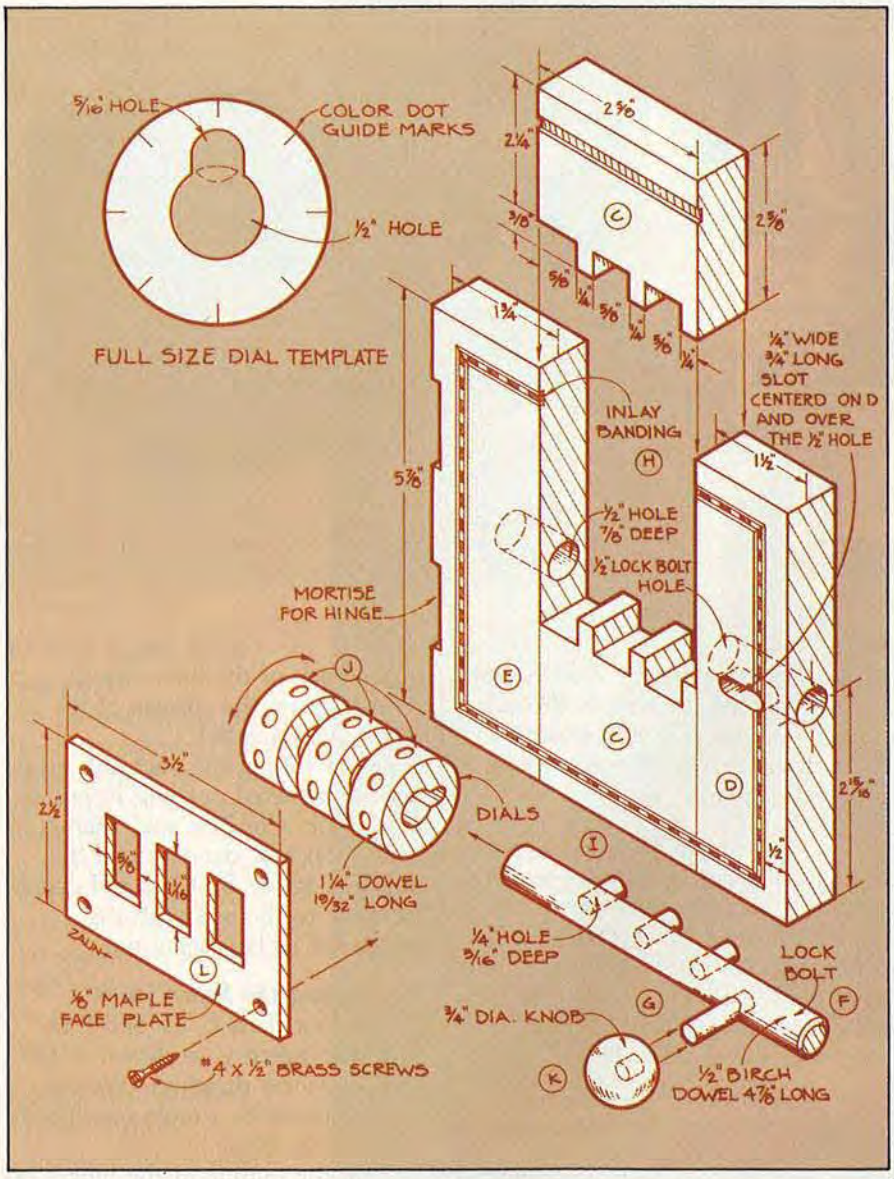
Assembling the Front Door

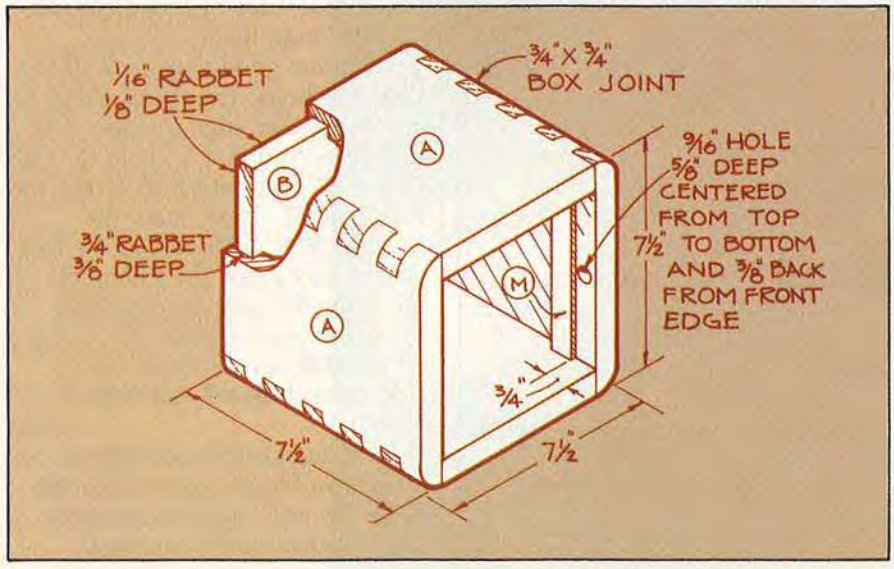
1 Cut door parts C, D, and E to size, then notch C as shown in the exploded-view drawing. (We cut the notches with a table saw fitted with a dado blade.)

2 Trace the outline of the hinges on the outside edge of E and cut mortises to house them.

3 To ensure good alignment of the lock bolt holes, dry-clamp pieces D and E together edge to edge. Use a drill press to drill a ½" hole through D and ⅞" deep into E to accept the lock bolt (F). Next, mark the ¾"-long × ¼"-wide slot in the face side of part D for the sliding pin (G). (See the note on exploded-view drawing for position.) Using a ¼" bit, drill several holes side by side, then clean the slot with a chisel.

4 Glue and clamp door parts C, D, and E (we fit a ½" dowel through the holes in D and E to keep the holes aligned while clamping).



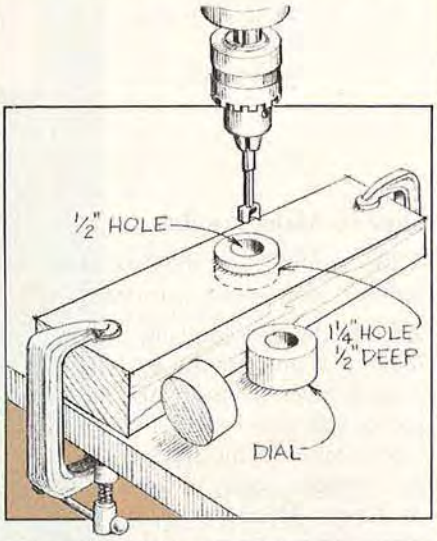


5 To fit the inlay banding (H), rout a 3/16" groove just a hair shallower than the thickness of the inlay, then glue the inlay in place. Let the glue dry, then sand the inlay flush with the surface of the door.

Making the Lock Mechanism

1 Cut the 1/2" lock-bolt dowel (F), the 1/4" dowels for the knob shaft (G), the lock pins (I) and the three 1 1/4" lock dial dowels (J) to length.

2 Using tracing paper, transfer the template markings to the dials (see the template at left.) Now, cut a 1/2"



Bill of Materials

Part	Finished Size T	W	L	Material	Qty.
A	3/4"	7 1/2"	7 1/2"	walnut	4
B	3/4"	6 3/4"	6 3/4"	walnut	1
C	3/4"	2 5/8"	2 5/8"	walnut	2
D	3/4"	1 1/2"	5 7/8"	walnut	1
E	3/4"	1 3/4"	5 7/8"	walnut	1
F	1/2" diam.		4 7/8"	birch dowel	1
G	1/4" diam.		1 1/4"	birch dowel	1
H	1/16"	3/16"	21"	inlay banding	1
I	1/4" diam.		9/16"	birch dowel	3
J	1 1/4" diam.		19/32"	birch dowel	3
K	3/4" diam.		3/4"	birch dowel	1
L	1/8"	2 1/2"	3 1/2"	maple	1
M	3/4"	1/4"	6"	walnut	1

Supplies: car model paint (8 colors), 4—#4x1/2" brass screws, 2—1" brass butt hinges and screws, paraffin wax, inlay banding, 4 rubber feet, finish (polyurethane, tung oil, shellac, or lacquer)

Continued on page 112

news and events

"The old pioneer familiarity with nearby forests is gone, dimmed by 20th-century urban influences. People have lost contact with real definitions of quality. The Newsletter's goal is to help reawaken wood awareness."

—Wood Unlimited Newsletter

If you really like wood, you'll like the anecdotes and information in each issue of *The Wood Unlimited Newsletter*, a bimonthly publication edited by Larry Freye and other knowledgeable folks in Indianapolis. In four black-and-white pages, they present little-known facts about wood and in-depth pieces on such topics as veneers, plywood, and new technology.

Published as an industry service, the newsletter is circulated free to designers, architects, educators, and wood-products manufacturers. Your local lumberyard or hardwood retailer may have copies to give away, but if not, subscriptions are available to the public for $8 a year. *Write: Wood Unlimited, Dept. W, P.O. Box 418044, Indianapolis, IN 46241. Back issues cost fifty cents each.*

Southeast Asia's Best Teak Soon Available

According to a friend of ours who is familiar with the international wood market, Thai teak will soon reach the U.S. in larger sizes and greater quantities. The Thai government has lifted its 1978 export restrictions, which limited shipments of teak lumber to small dimensions only. Many people think the Thai variety is the most desirable teak for woodworking, since it comes from 300- to 400-year-old trees (said to be the world's oldest). Noted for its fine color and texture, this stock works more easily than wood from younger trees.

Why? Because teak has the unusual ability to draw silica from the soil into its trunk as the sap flows. The silica breaks down and permeates the cellular structure as the tree grows old, acting much like a preservative. Young trees do have minute silica particles mingled in the grain, but the wood is rougher in texture and harder to work.

Woodworking Association of North America Launches Magazine

In our November/December issue, we mentioned that this newly formed group was seeking members, and that a quarterly magazine would be included in the organization's annual dues. The first issue is out. *International Woodworking*, Vol. 1, No. 1, contains 22 black-and-white pages, and covers tips, craftsmen, books, and events. For membership information, write Woodworking Association of North America, Dept. W, 35 Main St., Suite 6, Plymouth, NH 03264.

January 11–13
Woodworking World—The Houston Show

Location: Shamrock Hilton Hotel, Main Street, Houston, Texas
Admission: $5

February 1–3
Woodworking World—The Toronto Show

Location: Constellation Hotel & Convention Centre, Rexdale (Toronto), Ontario, Canada
Admission: $5

Tools, equipment, wood, and supplies for all levels of woodworking will be displayed and demonstrated by industry representatives. The schedule includes seminars on different aspects of woodworking. Hours for both shows: 5–9 p.m. Friday; 10 a.m. to 6 p.m. Saturday; 10 a.m. to 5 p.m. Sunday. For additional information about either show, contact Woodworking World, Plymouth, New Hampshire. Phone 603/536-3768.

February 16–17
Pacific Southwest Wildfowl Arts Festival

Location: Holiday Inn at the Embarcadero, 1355 N. Harbor Drive, San Diego, California
Admission: $2 donation

Wildfowl carvings, carvers, supplies, and demonstrations, plus decorative decoy competition with entrants from throughout the U.S. and Canada will mark this event's 11th year. (Decoy carvers wishing to enter the competition have until February 14 to apply.) Hours: 9 a.m. to 5 p.m. Saturday; 9 a.m. to 4 p.m. Sunday. For details, entry blanks, and further information, contact Kent Thompson, 530 B Street, Suite 2333, San Diego, CA 92101. Phone 619/231-7922. ■

News of interest to woodworkers and dates of national and regional woodworking events must be received at least three months before our publication date to be considered for the News and Events section. Send information to: News and Events, Better Homes and Gardens® WOOD Magazine, Locust at 17th, Des Moines, IA 50336.

Print this article

the old hand ways

THE CARPENTER

Print this article

By Roy Underhill

Master housewright at Colonial Williamsburg, host of the highly successful P.B.S. series "The Woodwright's Shop," author, lecturer, and master craftsman.

How can one person make a building that will endure for centuries when another's work falls and turns to compost long before he does? Take some time to study the skeleton of a well-framed old barn. (It must have been well-framed. It's still standing, isn't it?) You will see the truth of what a 1745 book of trades said of the carpenter, that "Strength is the chief of his study."

Study the barn's frame, its vertical posts, horizontal beams, and diagonal braces. Older than Stonehenge, this "post-and-beam" construction is the essence of the English building tradition. Indeed, the first English settlers in the New World built houses and barns that were not much different from the ancient stone monuments they had left behind: simple frames consisting of posts set into the ground with beams spanning their tops. They were wooden houses, but hardly the work of carpenters. It's no wonder there aren't any of them left.

If you think of a building as a human body, then the old-time carpenter's job is to make the bones and the skeleton—the strong frame to which the joiners and roofers later apply the protective skin. Good carpentry makes strong frames by exploiting the wood's strength in three dimensions: the size of the building's individual timbers, the connections between these pieces, and the design of the frame as a whole. When all these aspects of the building work together, the carpenter has earned his pay.

Beams

Take a wooden pencil and push in from its ends to make it shorter. No go. Now bend it and it snaps in half. The point is that it is easy to make a strong post but harder to make a strong, yet lightweight beam. You need a way to size timbers so that they are as strong as they need to be, but no heavier than they must be. Fortunately you can turn to a simple guideline for help: *The strength of a rectangular beam varies directly with changes in width. With changes in depth, however, the difference in strength is squared.*

Imagine that you have to support a load with a beam measuring 2 inches wide and 4 inches deep. A 4 by 4 would be twice as heavy and twice as strong. A 2 by 8, however, twice as deep as the original timber, would also be twice as heavy, but would have four times the strength. A 2 by 12 would be nine times as strong, and only three times as heavy. The more a carpenter knows about the strength of his timbers, the more confidently he can approach the limits of the material.

Joints

You often hear that old buildings are held together entirely by wooden pegs. True, the pegs are there, but the strength of the buildings is not in their pegs, but in their joints. These mortise-and-tenon joints interlock the timbers so that they sit solidly within one another. It is a rare building from which you couldn't remove every peg and have it stand as strong as before. (Try this with the nails in a modern structure.)

Carpenters at Carter's Grove plantation work on a seventeenth-century style tobacco barn.

Braced Frames

Although a post planted deeply in the ground won't fall over, it will invite destruction by termites and rot. Once you protect a building by placing it up on foundations, however, you must stiffen it by adding the strength of triangles to the rectangular frame.

Diagonal braces strengthen the building in several ways. Ideally, a post is a perfectly vertical column that is compressed but not bent. If the post does start to bow, it can snap relatively easily. Braces connected to the post prevent the bend from getting started. And, by blocking the closure of the right angles created between posts and beams, braces also prevent the collapse of a building under wind

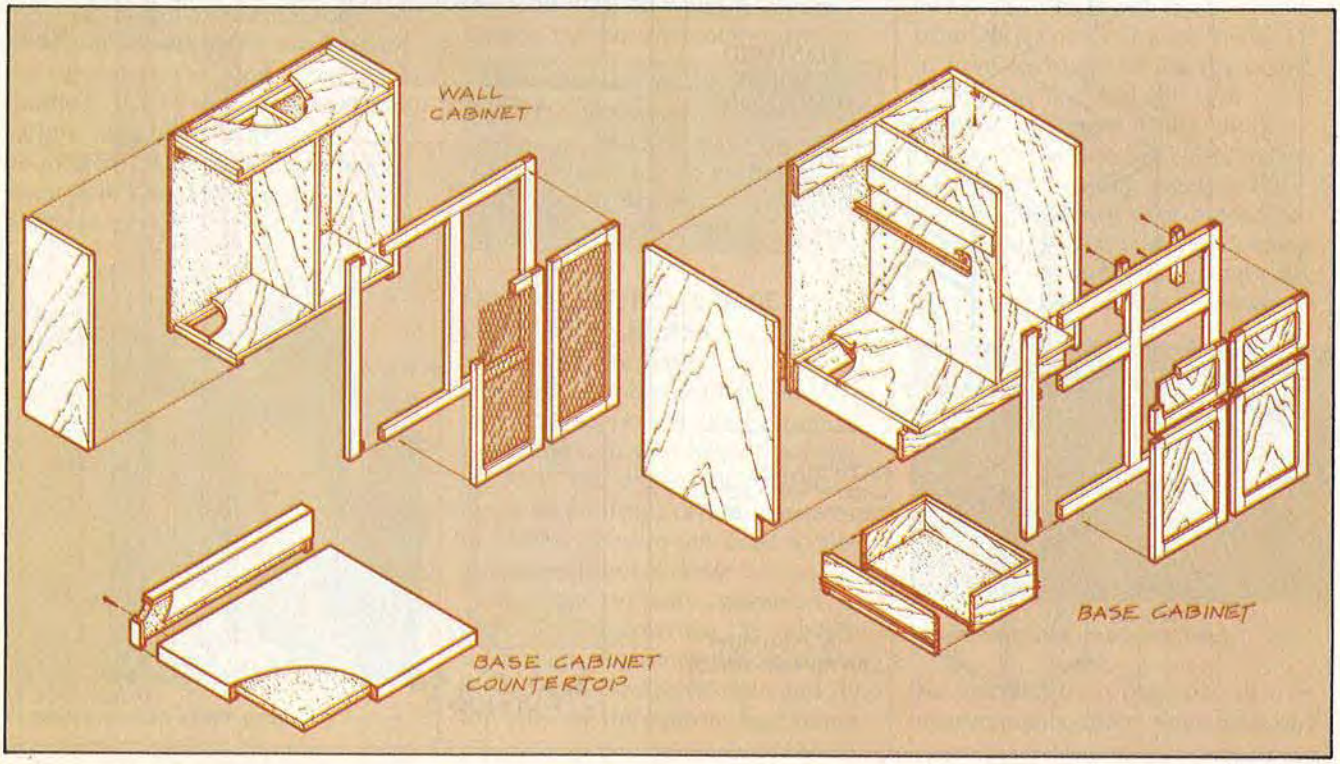
Continued on page 119

basic cabinet construction

Woodworkers everywhere appreciate the beauty of well-crafted cabinetry But many of these same people labor under a false impression—that cabinets must be terribly difficult to make. Not so! And to prove it, we're going to walk you through the steps that will yield good-looking cabinets every time.

Print this article

We've selected a straightforward example—a base cabinet with a bar sink and a matching wall cabinet—to illustrate the basics you need to know as a novice cabinetmaker. (See the exploded-view drawings below for how they go together.) Once you've mastered the procedures that follow, you can handle many cabinetmaking situations. Though the dimensions, and maybe even the style of cabinet, may change, much of what you learn will still apply.



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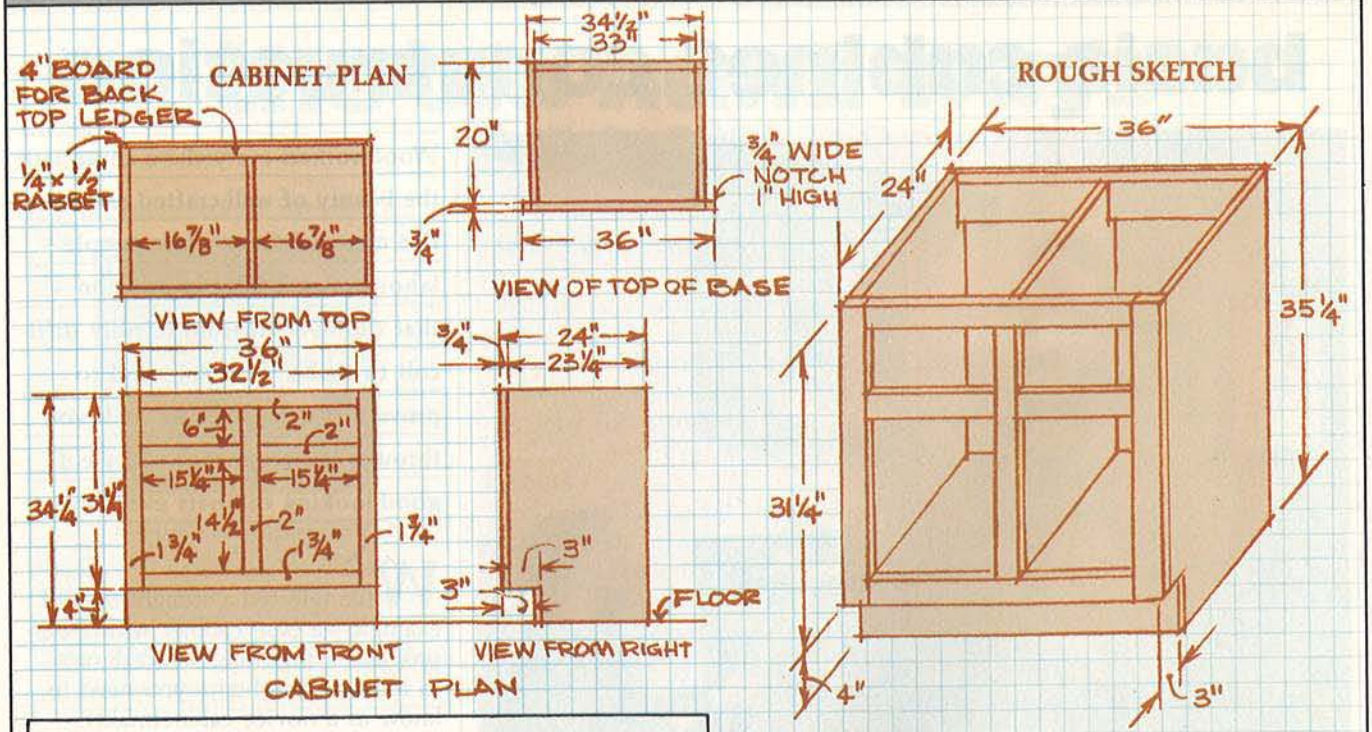
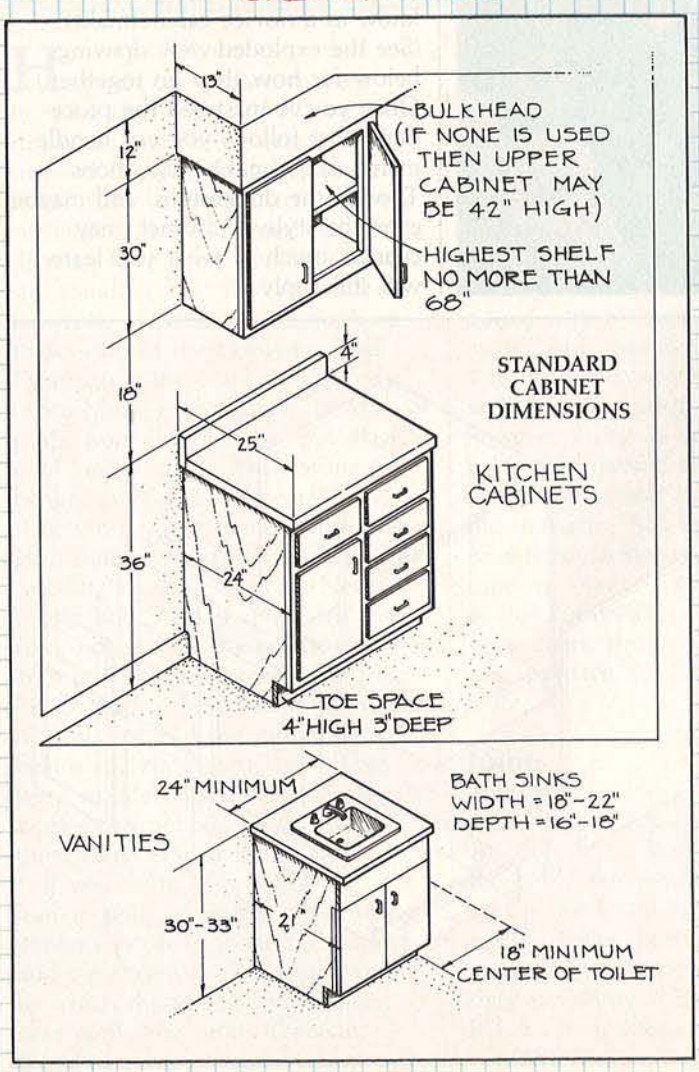
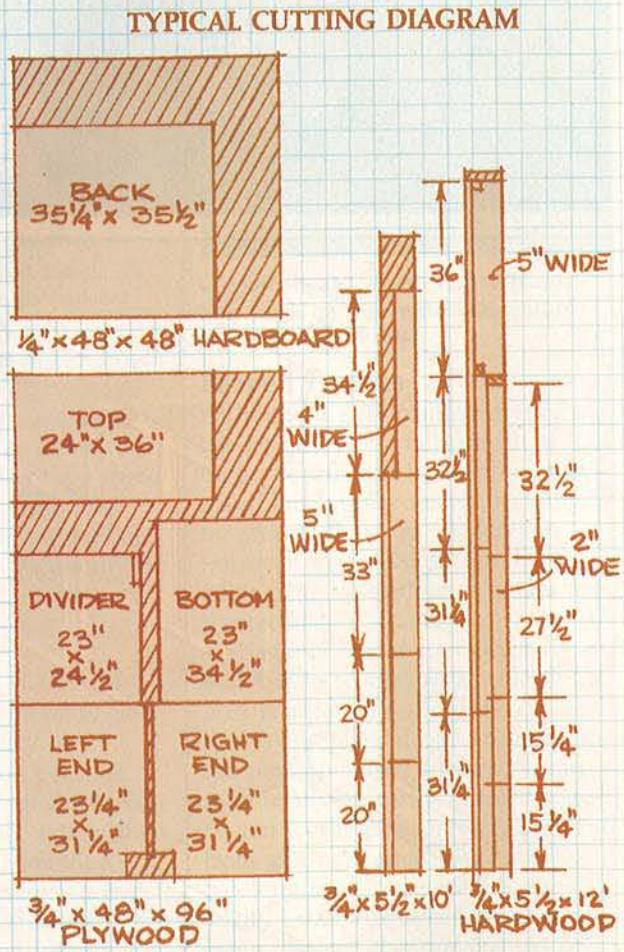

4" BOARD FOR BACK TOP LEDGER
CABINET PLAN
¼" x ½" RABBET
16⅞"
16⅞"
VIEW FROM TOP
34½"
33"
20"
¾"
36"
VIEW OF TOP OF BASE
¾" WIDE NOTCH 1" HIGH
36"
24"
35¼"
31¼"
4"
3"
ROUGH SKETCH
36"
32½"
6"
2"
2"
15¼"
15¼"
34¼"
31¼"
14½"
2"
1¾"
1¾"
1¾"
4"
¾"
24"
23¼"
3"
3"
FLOOR
VIEW FROM FRONT
VIEW FROM RIGHT
CABINET PLAN


13"
12"
30"
BULKHEAD (IF NONE IS USED THEN UPPER CABINET MAY BE 42" HIGH)
HIGHEST SHELF NO MORE THAN 68"
4"
18"
25"
36"
24"
STANDARD CABINET DIMENSIONS
KITCHEN CABINETS
TOE SPACE 4" HIGH 3" DEEP
24" MINIMUM
VANITIES
30"-33"
21"
BATH SINKS WIDTH = 18"-22" DEPTH = 16"-18"
18" MINIMUM CENTER OF TOILET


TYPICAL CUTTING DIAGRAM
BACK 35¼" x 35½"
¼" x 48" x 48" HARDBOARD
TOP 24" x 36"
DIVIDER 23" x 24½"
BOTTOM 23" x 34½"
LEFT END 23¼" x 31¼"
RIGHT END 23¼" x 31¼"
¾" x 48" x 96" PLYWOOD
36"
5" WIDE
34½"
4" WIDE
32½"
32½"
5" WIDE
2" WIDE
33"
31¼"
27½"
20"
15¼"
31¼"
20"
15¼"
¾" x 5½" x 10'
¾" x 5½" x 12' HARDWOOD

START WITH A PLAN

Obviously, before you order a single sheet of plywood or a board for your project, you have to have a good idea of how you want the end product to look. You'll also want to settle on the cabinets' overall dimensions.

The Rough Sketch

Though some visually oriented woodworkers can build as they go, most of us need a rough sketch to guide us along the way. This sketch needn't be sophisticated (see our example in the shaded area at left), but do try to be as detailed as possible. It's also helpful to draw front, end, and top views of the project as well as any other details that clarify construction. Since there are some cabinetmaking standards often used by professionals that you may not know about, we've included them in the box at left. Use them to flesh out your rough sketch.

The Story Pole and How It Can Help You

Once you have established the width, depth, and height of a cabinet, make yourself a *story pole.* This device, which can be a scrap piece of lumber or sheet goods, will show you *exactly* how much room the cabinet will occupy when it's finished. It also shows you where various members of the cabinet will be located. And most important, a story pole allows you to measure distances exactly.

Visualizing with story pole

The photo at the bottom of the previous column shows what information we transfer to the front side of the story pole and how we use it to visualize the end result. (Essentially, what we have here is a section view of the cabinet near the front.) After studying the story pole and making any desired adjustments, we then turn our scrap

A view from the top

board over and plot what amounts to a top view of the cabinet (see the photo above). If you want, you can use the same technique to take a look at the cabinet's depth.

Make a Cutting Diagram

When you make a cutting diagram, you're doing yourself a couple of big favors. Not only does the diagram help you figure the materials requirements for the cabinet, it also serves as a guide when it comes time to cut out the components.

Note: When laying out the cabinet's end panels on the plywood, make sure that you have the grain running from top to bottom. The same applies to doors if you plan to use plywood for them.

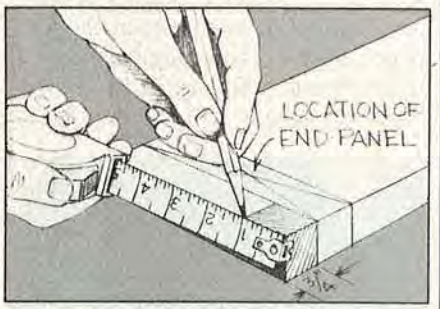
HOW TO BUILD A BASE CABINET CARCASS

Start With the Base

The base of a base cabinet adds structural support at the bottom of the cabinet. It also helps form the toe kick, the strategically placed recess at the front of the cabinet that allows you to get close to the cabinet without kicking it.

Toe kicks typically measure 4" high × 3" deep when the cabinet is finished. But since the bottom of the cabinet sits on the base and the top edge of the bottom face frame rail rests flush with the bottom's top edge, you have to make the base somewhat taller to end up with a 4" high toe kick. (After referring to our story pole, we cut the *toe board* 5" high and as long as the cabinet is wide.)

Now, lay the toe board on a flat surface and mark the location of the notches that the end panels will pass through. Also lay out the posi-



tion of the end panels as shown above. (The notch at both ends of the toe board in this instance measures ¾" wide and 1" deep.)

After notching the toe board, cut the sides and the back of the base to size. Since neither the sides nor back will show when you complete the cabinet, you may want to use scrap wood for these parts.

After dry-fitting the parts, nail and glue scrap wood cleats ¾" in from each end of the back and 1½" in from each end of the toe board. Then, glue and nail the base together as shown in the photo below. Note that the cleats make aligning and nailing together the base pieces a very easy procedure.

While the glue is still wet, check for square by measuring diagonally from corner to corner as shown in

Assembling the cabinet's base

the first photo on page 62. (If the measurements differ, your base isn't

Continued

Checking for square

square.) To square the base, you'll have to *rack* it as shown in the photo below. (You may have to make several adjustments to get the base into square, so be patient.)

Racking the base

To hold the base in square, nail braces across the corners as shown in the photo above.

Cut the End Panels

Typically, end panels measure ¾" shorter than the finished height of the cabinet and ¾" narrower than the depth of the cabinet. Start by cutting the side panels to size. Then, fasten the panels together (good faces out) with cleats tacked to two adjacent edges. The cleats keep the panels in alignment while you cut their notches.

Mark the location of the 4"-high × 3"-deep notch on both panels. If you'll be using a table saw, you have to make sure not to cut too far when making your cuts. To do this, raise the blade to its highest setting and mark the point on the auxiliary fence at which the blade enters the work.

Set the fence the correct distance from the blade, test the measurement on scrap, and then make your first cut (stop the blade when your cutoff mark aligns with the one on the fence). Now, turn the panels over, reset the rip fence, and make the second cut.

You'll notice that the cuts fall somewhat short of the cutoff marks. Finish them with a handsaw, as shown in the photo below. Before separating the panels, make a

Notching the end panels

mark on the face of each (doing this will enable you to identify the outside of the panels later).

To complete the machining of the cabinet end panels, you need to cut a ½" rabbet ¼" deep along the back edge of the panels. Unless you have a dado set or blade, making the rabbet requires two cuts. We show the setup for the first pass below. Note that a feather board and a brace (both clamped to the

Rabbeting the end panels

saw table) provide the necessary control to make the cut accurately. To make the second cut, reset the rip fence, and the height of the saw blade, make a test cut, then complete the rabbet.

Cut and Install the Bottom, Back, and Divider

Start by dry-fitting the end panels and the base. Pipe clamps will hold the assembly together well enough to take your measurements. Measure for the depth of the bottom as shown in the photo at the top of the next column (note that the bottom aligns with the front of the

Measuring depth of bottom

end panels and the rabbet in back). Measure again for the width of the bottom, then cut the bottom to size. (Since the divider panel is the same depth as the bottom, cut both parts using the same saw setting.)

Set the bottom on the base, then measure the height of the divider panel as shown in the photo below. Cut the divider to size.

Measure and cut the ¼" hardboard cabinet back and the cleat

Determining height of divider

that joins the end panels at the top back of the cabinet. (We used a 5"-wide cleat.) Then, glue and nail the end panels and bottom to the base. Secure the cleat between the end panels, either using hot-melt

Securing cleat to end panels

glue as we did here, or with glue and clamps.

Predrill the hardboard back, then screw it to the end panels, base, and top cleat. Slip the divider into position and mark the bottom of the notch you need to cut in its top

Marking notch in divider

back edge (see the photo above). Notch and install the divider in its correct location. (Refer to your story pole for the exact location of the divider.)

HOW TO BUILD A WALL CABINET CARCASS

Though base and wall cabinets do share many construction similarities, they differ in several respects, too. That's why we feel it's necessary to take you quickly through the following wall-cabinet carcass how-to.

Begin by cutting the end panels to size (refer to your story pole or drawing for the correct size). Then, cut a ½" rabbet ¼" deep along the back edge of the panels.

Now, cut ¾"×¾" hardwood cleats, and glue and screw them to the top and bottom of the end panels as shown in the photo below. After doing this, rip the top

Fastening cleats to end panels

and bottom the correct width, then crosscut them to the correct length.

Glue and screw the top and bottom to the cleats on the end panels, check for square, and allow the glue to dry. Then, measure as shown in

Measuring height of divider

the photo above determine the correct height of the divider panel. (Note that we took the measurement near the end panel. By doing this, we avoided getting an inaccurate measurement if the top or bottom panel had been bowed.) Cut the divider panel to size.

To add further stability to the cabinet, cut and install hardwood ledgers below the top and bottom shelves. (We used a ¾"×¾" ledger under the bottom shelf and a ¾"×1½" one under the top.)

Now, cut, notch, and install the plywood divider, and cut the back to size and screw it to the carcass.

BUILD THE FACE FRAME

Face frames tie the front of the cabinet together structurally and at the same time finish it off visually. When determining how wide to cut the various face frame members, keep in mind that you want it to look balanced when you complete the cabinet.

In the base cabinet we're using as our example, the stiles and the bottom rail measure 1¾" wide; the top rail, mullion (or vertical member between the stiles), and muntins (the horizontal members between the rails), 2". Why the difference? All parts in the latter grouping have two doors or drawers overlapping them, whereas the stiles and the bottom rail have only one doing so. The net result: a visually balanced frame.

Keep in mind, too, that whenever you cut face frame parts, you do so from the outside in: stiles first, then the rails, then the mullion, and the muntins. But when you assemble the frame, you do so from the inside out: muntins first, and so on.

Start by measuring the distance between the top of the cabinet carcass and the top surface of the cabinet's bottom. We added 1¾" (the width of the bottom rail) to this measurement to determine the length of the stiles.) Cut the stiles to length.

To figure the length of the rails, measure from the outside of one of the end panels to the outside of the other. Add ¼" to that figure, then subtract the combined widths of the stiles. Cut the rails to size.

The photo below shows a quick, easy way to make sure the rails are

Checking length of rails

the right length. Set up a length stop, position the rail against it, and move the miter gauge forward just far enough to nick the rail. Pull the material back, check it for accuracy, and, if necessary, reset the length stop. Flip the rail over and make the cut from the opposite side. The nick will never show. This same procedure works well when cutting mullions and muntins, too.

Next, clamp the rails and the stiles together as shown in the photo below (note the placement of the clamps). Measure as shown to

Measuring length of mullion

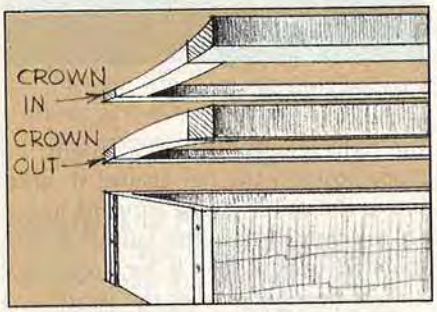
find the length of the mullion, then cut it to length. Now, remove the

Continued

clamps from the frame, line up the ends of the top and bottom rails, and mark the location of the mullion as shown below. Use the same procedure to find the length of the muntins, then cut them to length.

Marking position of mullion

Lay out the face frame parts. If any of the parts happen to be crowned (you can check this by sighting down the face of each board), the crown must face out (see the sketch below). Mark the



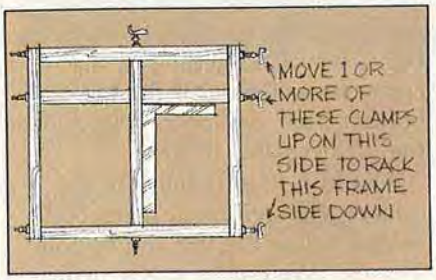
face of each part, then clamp all of them together. Once you have the parts aligned and in their proper spots, make two marks across each joint line where two members meet (see the photo below). Also mark

Marking dowel pin locations

each joint as A-A, B-B, and so on to avoid mixing up the parts.

Remove the clamps from the frame and then drill dowel holes, using your marks as a guide. Remember that you want the combined depth of the mating holes 1/16" or so deeper than the length of the dowel pins you're using.

Now, insert glued dowel pins into the holes you've bored, and assemble the frame—from the inside out. Use clamps to hold joints tight. While the glue is still wet, check for square, and rack the frame into square, if necessary. See the sketch below for how to do this.



When the glue dries, remove the clamps and sand the face frame smooth.

ATTACH THE FACE FRAME TO THE CARCASS

Glue and clamp the frame to the carcass, making sure that the top of the bottom rail aligns with the top of the carcass bottom, and that the frame overlaps both cabinet ends evenly. (See the photo below.)

Attaching the face frame

When everything aligns properly, drive finish nails through the frame and into the carcass sides and bottom.

Before nailing the mullion to the divider panel, be sure that you

Centering divider behind mullion

center the panel behind the mullion. Clamp the two members together as shown in the photograph above and then drive your nails.

CUT AND INSTALL THE SHELVES

Usually, shelves measure 1/8" narrower than the width of the cavity into which they fit and 1/8" shorter than the distance from the cabinet's back to the back side of the face frame, so you shouldn't have any difficulty figuring their size.

Most cabinetmakers band the front edges of shelves with thin strips of a wood that's compatible with that being used on the cabinet. But you also can band them with wood veneer tape, if you wish. Either way, be sure to figure the thickness of the material used into your calculations.

Positioning holes for shelf clips

Cut the shelves to size, then test-fit them to make sure there's sufficient play to accommodate the shelf clips you'll be installing later.

The photo at the bottom of the previous column shows about the easiest way we know of to position the holes for shelf clips. The perforated hardboard serves as a template that ensures that the holes on either side of the shelves align exactly. Set the template on the cabinet bottom and against one of the end panels and drill a series of holes. Then, with the template in the same relative position, move it to the opposite panel and drill another series of holes using the same guide holes as before.

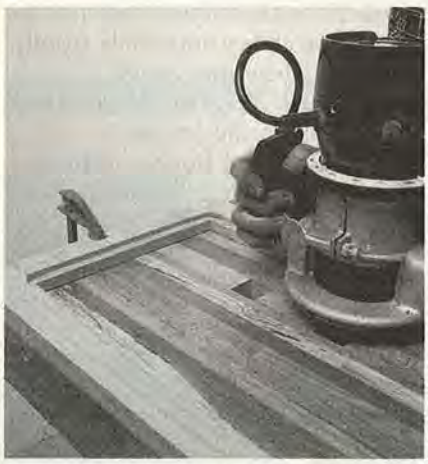
Note: If you drill holes into both sides of the divider, you'll need to offset one set from the other.

BUILDING THE DOOR AND DRAWER FRONTS

With *slab-type* doors and drawers, you simply cut the panels to the appropriate size, band or veneer the edges, and perhaps decorate the panel. But the *frame-and-panel* option consists of a joined frame into which a variety of inserts can go. In our example, we've chosen to go with a frame that fits together with dowels, just as the face frame did. We've also opted for *overlay* doors and drawers rather than the *lipped* or *flush* type.

Typically, doors and drawer fronts overlap their openings by ¼" all around (the hinge configuration can alter this somewhat). In our example, to figure the size frames you need, add ½" to both the height and width of each opening. Then, cut the frame parts to size (rails fit between the stiles here, too).

You machine and assemble these frames somewhat differently than you did the face frames. If you go with thin plywood panel inserts, you may want to cut a groove in the center of the inside edge of the frame members, and insert the panel as you assemble the frame. For glass or other inserts, you assemble the frame first, then rout out a rabbet on the back side of the



Routing back side of door

frame (see the photo at the top of the next column) to accept the material. (Since we decorated the fronts of the doors and drawer with a pattern along the inside edges, we used the latter technique.)

HANG THE DOORS

Begin by screwing the hinges to the doors. (A general rule of thumb here calls for the hinges to be "a hinge-length in" from the top and bottom of the doors.) Then, position one of the doors over its opening as shown below (door must overlap opening evenly).

Positioning door over opening

Now, mark the position of the hinge mounting holes on the stiles, drill pilot holes, and hang the doors.

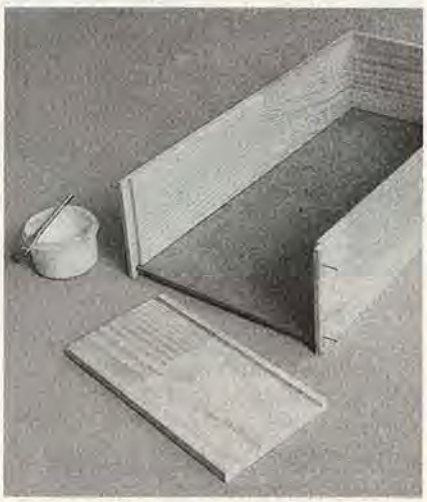
BUILD AND INSTALL THE DRAWERS

Drawers certainly can be made in several different ways, but we've chosen to make ours with side-mount drawer slides and a drawer front that screws onto the drawer assembly. (Door fronts that are independent of the drawer allow you to change the look of a cabinet at a later date if you want without totally rebuilding the door.)

First, cut and fasten drawer-mount blocks to one end panel and the divider panel. (The bottom of the block should align with the top of the muntin below the opening.) The idea is to provide a surface on which the drawer slide can bear: you'll want the block thick enough so that its face is flush with the inside edge of the stile and mullion.

How you size the drawers varies depending on the type of slide you use. With side-mount type drawer slides, you'll usually want the width of the drawer to be 1" narrower than the width of the opening (check the drawer slide package instructions to make sure). The height of the drawer parts should be ¼" shorter than the height of the drawer opening. And as for the drawer's depth, most cabinetmakers stop it just short of the depth of the cabinet. For example, if the distance from the front of the face frame to the cabinet back measures 23 inches, you'd want the drawer 22½" at most.

Now, cut the drawer parts to size and assemble them as shown in the photo below. Note that both ends of the drawer sides have rabbets that accept the front and back, and that all four sides of the box have



Assembling the drawer

Continued

¼" grooves ½" up from the bottom edge to accept the drawer bottom.

Install the drawer slides according to manufacturer's instructions. Then, put the drawer in the cavity, stick a couple of pieces of two-sided tape to its face, and position the drawer front as shown in the photo below. When you're satisfied with the front's position, squeeze the front and the drawer together, pull the

Positioning the drawer front

drawer partway out, and clamp the two together. Remove the drawer from the cavity and screw the drawer front to the drawer as shown here. (You'll undoubtedly have to shim and adjust the drawer slides to square the front with the face frame and to achieve a tight

Screwing front to drawer

fit, and that can require patience. We use cardboard for our shims.)

ATTACHING A FALSE FRONT

In some cabinetmaking situations, such as in our example, plumbing fixtures or other items make it impractical if not impossible to put a drawer where one would normally be. So what do you do? False fronts to the rescue!

You build false fronts exactly as you do the fronts of drawers. But instead of screwing the front to a drawer, you fasten false fronts to the face frame with cleats. The photo below shows you how. Align

Attaching false front with cleats

the front with the other doors and drawers on the cabinet before you tighten the cleats to the back side of the face frame.

ADD A CABINET TOP

You can either purchase a commercially available top for your cabinet or build it yourself. We site-built ours, then covered it with plastic laminate. It's easy!

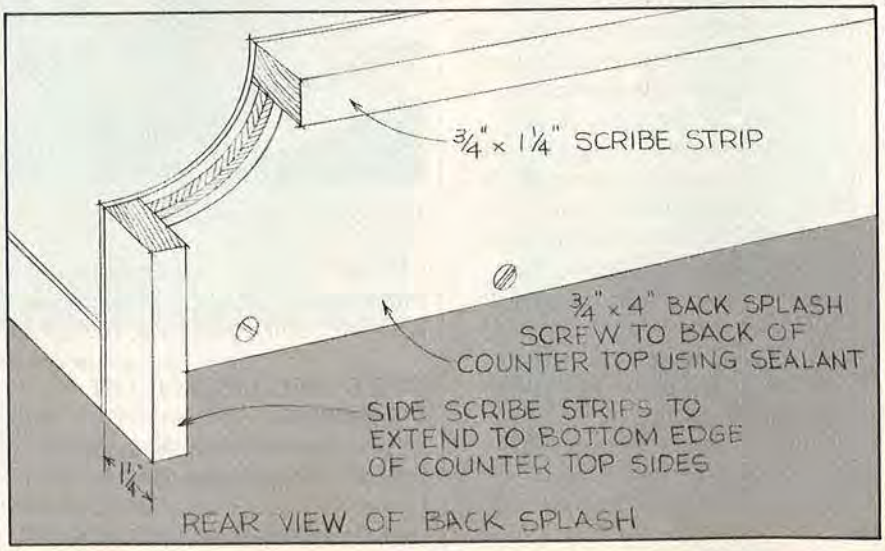
For tops without backsplashes, cut a piece of ¾" plywood ½" wider and ¼" deeper than the cabinet. Now, face the front and sides of the cabinet with ¾" × 1½"-strips on edge. Cover all exposed surfaces with plastic laminate, starting with the side edges, the front, and finally the top. Place the counter on the cabinet, scribe it to the wall if necessary, then fasten the top to the cabinet with metal angles.

If you want to add a backsplash, cut a ¾" plywood countertop that measures ½" wider than the cabinet, and ¼" deeper than the cabinet less the thickness of the backsplash. Band the front and both sides with ¾" × 1½" strips on edge.

Now, for the backsplash, cut a piece of ¾" plywood the width of the countertop, less the combined thickness of the scribe strip material that fastens to both ends of the backsplash. (The scribe strip allows you to custom-fit the cabinet to the wall.) Fasten the strips to the ¾" plywood as shown below.

Next, cover the counter with plastic laminate, starting with the side edges, the front, and the top. Do the same to the backsplash—ends first, the top, and the front.

Now, screw the backsplash to the counter, set the cabinet and countertop in place, scribe the backsplash to fit snugly against the wall (if necessary), and fasten the top to the cabinet with metal angles. ■


¾" × 1¼" SCRIBE STRIP
¾" × 4" BACK SPLASH
SCREW TO BACK OF
COUNTER TOP USING SEALANT
SIDE SCRIBE STRIPS TO
EXTEND TO BOTTOM EDGE
OF COUNTER TOP SIDES
1¼"
REAR VIEW OF BACK SPLASH

the bow-back windsor chair

Print this article

We assemble every product featured in Kit Builder and give special attention to instructions, the quality of materials and parts, and the relative ease or difficulty with which the kit goes together.

In the 1770s, Joseph Henzey was a top chair maker in Philadelphia, the center of Windsor chair making in the American colonies. This bow-back armchair kit, a faithful reproduction of an original by Henzey, is a delight to build and an interesting lesson in nearly clamp-free joinery. The kit arrived with finely machined parts, glue, even a rope tourniquet for clamping the legs and stretchers. Sandpaper and stain were also included, but a finishing product was not. (Finishing is discussed in the instructions, but the choice—and purchase—of a varnish or oil finish is left to the individual.)

The clearly written step-by-step instructions were thorough and complete, although we felt that a bit more space could have been allotted to larger, clearer drawings. (The manufacturer told us that we had received preliminary plans and that final instructions were being prepared.) The chair is assembled in two general stages: from the seat down (for the leg assembly), and then from the seat up (for the back and arms). Construction took about four hours: less than two hours of actual working time (including 20 minutes for sanding spindle ends and finish sanding), plus two hours of waiting for glue to dry. ■

The Henzey Bow Back Windsor Arm Chair Kit. Available from Cohasset Colonials, Dept. W., 494IX Ship Street, Cohasset Harbor, MA 02025. The kit sells for $179 plus shipping. A color catalog of kits is available for $1.

Project showcase

There's a lot of quality woodworking being done these days, and we like to show it off. In each issue of WOOD, we devote this space to a display of projects submitted by our readers. From boxes to bowls, and carvings to cabinets, we'd like to see them if they're made of wood. To submit projects, follow the instructions at the end of the article.

A. Queen Anne Writing Table

Proving that he knows how to work the wood he's so knowledgeable about, our "Wood Profile" columnist, Paul McClure, of Tempe, Arizona, sent us this photo of the solid cherry writing table he made for his wife. To accentuate the "quilted" figure of the wood, Paul inlaid bird's-eye maple into book-matched pieces of re-sawn cherry. Being "in the business" helped, because all the cherry came from the same piece of wood which Paul had picked up during his wood buying years for a large lumber company.

He glued up the cabriole legs after turning the table's "doe" feet on a lathe. To finish the piece, McClure sprayed on and then buffed out Deft Clear Wood Finish thinned with acetone. Designed to fit his wife perfectly, the table measures 42"×20"×29" high.

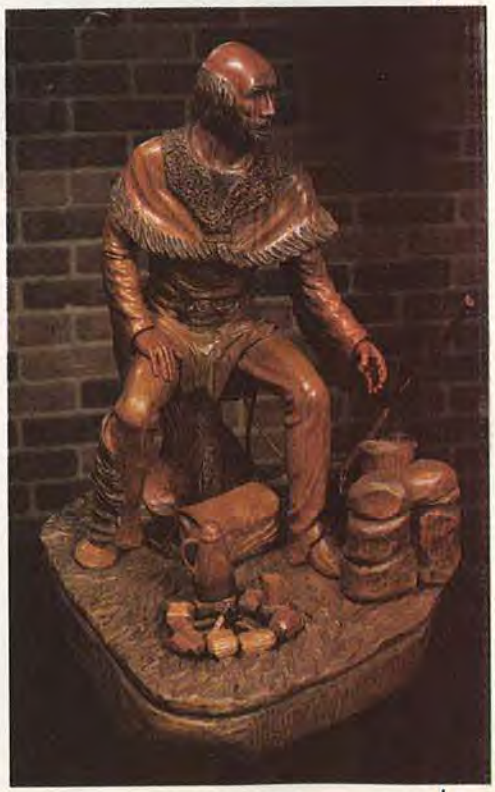
B. Touchdown Turning

An active member of the International Wood Collectors Society, Rex Vaught, of Rockville, Indiana, made this and several other full-sized footballs as gifts. Using a process he calls "post-blocking," Rex laid up pieces of walnut and maple for the body, which he turned on a lathe. The laces are inlaid holly, ebony, and walnut. Rex doesn't throw passes with his creation, but he does win cheers for his woodworking talents wherever it's displayed.

C. Catalpa Wood Carving

Fred Carrington of Nixa, Missouri, tells us that catalpa, a domestic softwood, can be worked green and will never crack. We hope so, because Fred used catalpa for this intricate carving, "Uninvited Guest," which depicts a scene from the Old West, Carrington's favorite subject area. Historically accurate down to the .50 caliber Smith & Hawkins rifle the figure reaches for, the carving stands 17" high.

Fred began the piece by fashioning a model in sculptor's clay. When he was satisfied with every detail, he began to carve. He spent six 50-hour weeks on the project,



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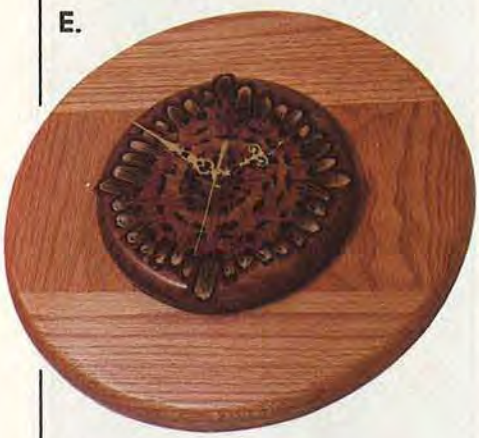
D.

E.



which he finished with thinned artist's oils and Minwax. Occasional buffing with a soft cloth is all that's needed to keep the piece looking lustrous.

Incidentally, Fred belongs to a group called the Ozark Mountain Woodcarvers, headquartered in Branson, Missouri. If you ever have an opportunity to visit this group's retail outlets—in Branson, Silver Dollar City, and Gatlinburg, TN do so. You'll see some of the finest wood carvings anywhere.

D. Band-Saw Bowl

Robert St. Pierre, of Hanover, Massachusetts, uses a band saw, not a lathe, to build pieces like this handsome mahogany vessel which measures 12″ in diameter by 7″ high. Robert has devised a mathematical formula that allows him to cut a series of consecutive rings at varying angles and then lay up the pieces to make objects in virtually any shape he wishes. After gluing up his designs, he fine-sands the piece and then coats it with oil-based urethane.

E. Fine-Feathered Wall Clock

Plumage from a ringneck pheasant adds a warm, outdoors look to this oak-and-walnut wall clock made by Marlen Kemmet, who spends most of his time in the WOOD editorial offices and shop, where he works as the magazine's "How-To" editor.

Marlen glued up four pieces of ¾″ oak, alternating the grain to add visual interest, and routed a cavity in the back of the black walnut to accept a battery-powered clock movement. He applied satin-finish polyurethane to give his clock a low sheen. The feathers, attached with white glue, are untreated. If anything ruffles them, Marlen says, he holds them over steam to bring them back to shape.

F.

F. Chinese Motif Table

Traditional Chinese designs inspired David Lawrence, of Exeter, Rhode Island, to plan and build this distinctive table, which measures 25″×48″×29″ high. A 5/4 walnut top with padauk trim sits atop gracefully curved legs, which are bent laminated, and joined with splined miters.

In the Chinese manner, David used frame-and-panel construction to fit the top into the table's edge molding. All the grid-work pieces on the table were made with mortise-and-tenon joints, a time-consuming method that ensures strength and stability in the piece.

To highlight the beauty of the wood, David rubbed on multiple coats of Watco Danish Oil. ■

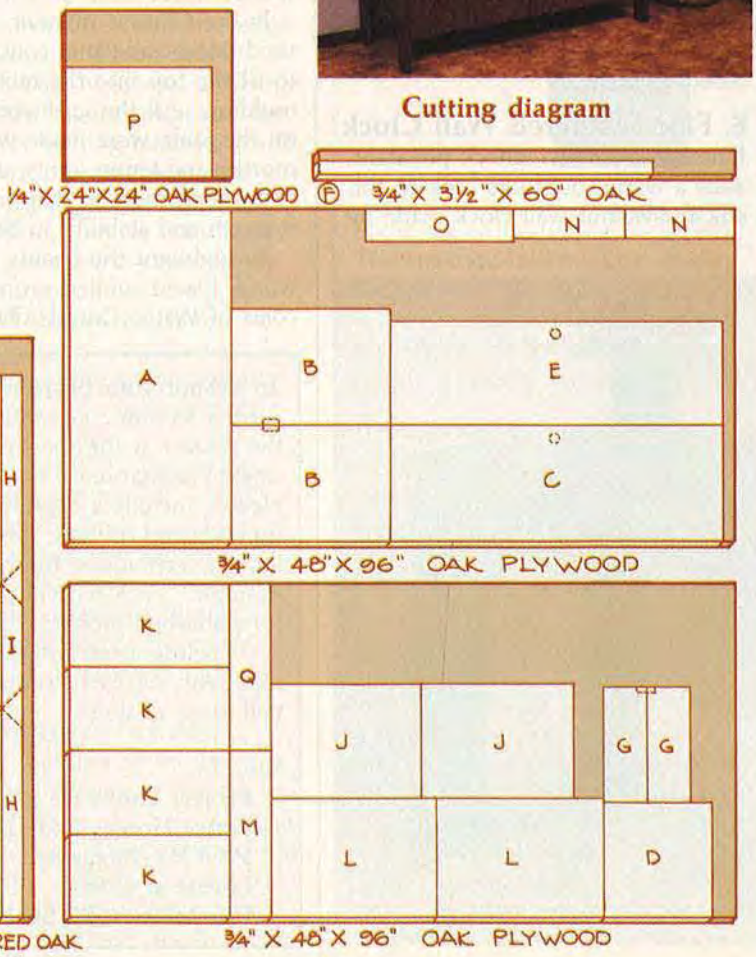
To submit your projects:
Send a 35-mm color slide, with the project as the focal point in a simple background. No people, please! Include a capsule description—materials used, special joinery techniques, finish, for example. WOOD will pay $25 for published projects. Unless you enclose a self-addressed envelope with sufficient postage, we will keep all slides.

Send to:
Project Showcase
Better Homes and Gardens®
WOOD Magazine
Locust at 17th
Des Moines, IA 50336

stereo component unit

Print this article

Clean design and basic cabinet-construction techniques converge in this handsome stereo cabinet. The cabinet we built measures 50⅛" W × 18½" D × 30¼" H. Please turn the page for step-by-step instructions.

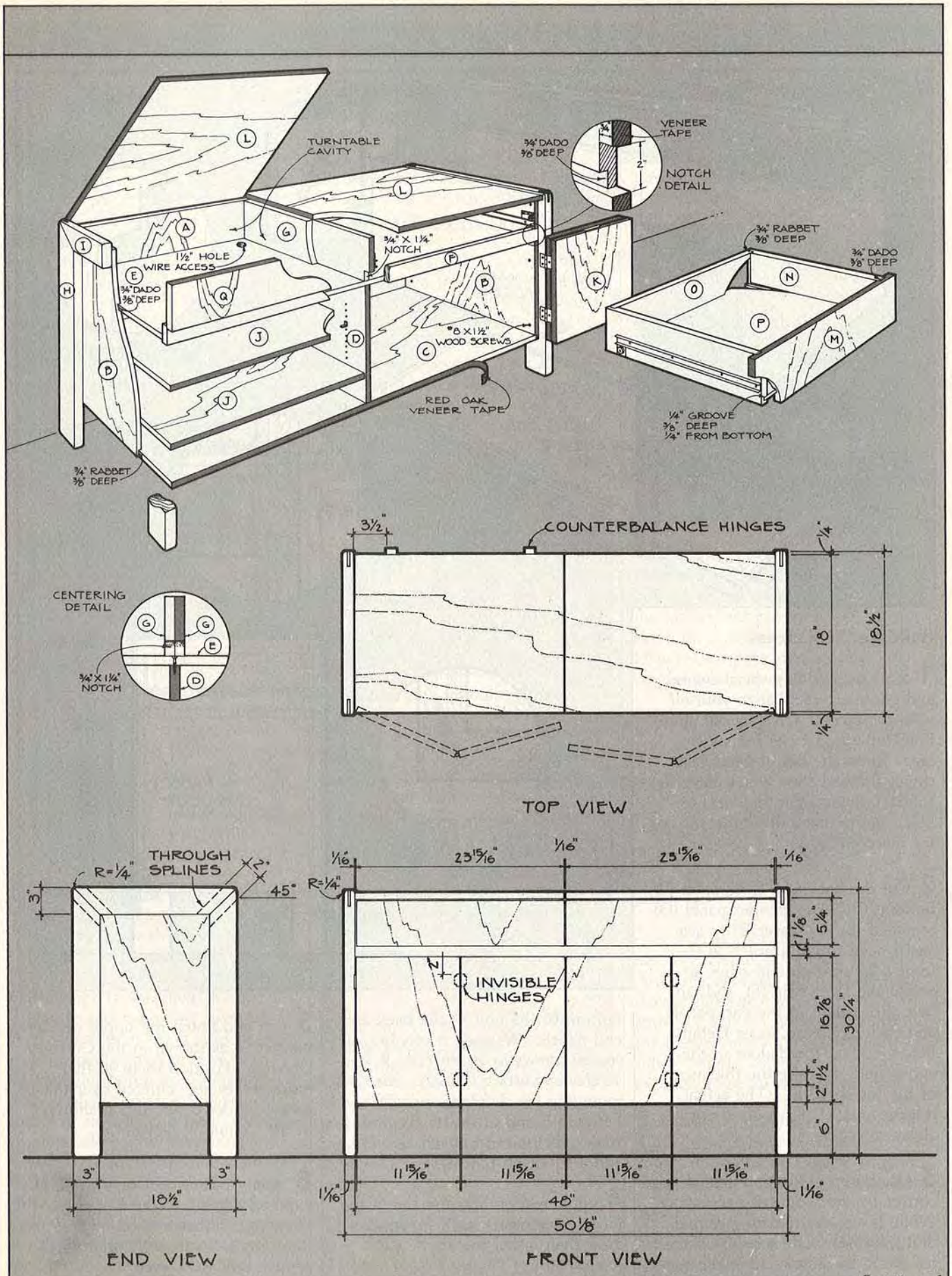


Bill of Materials

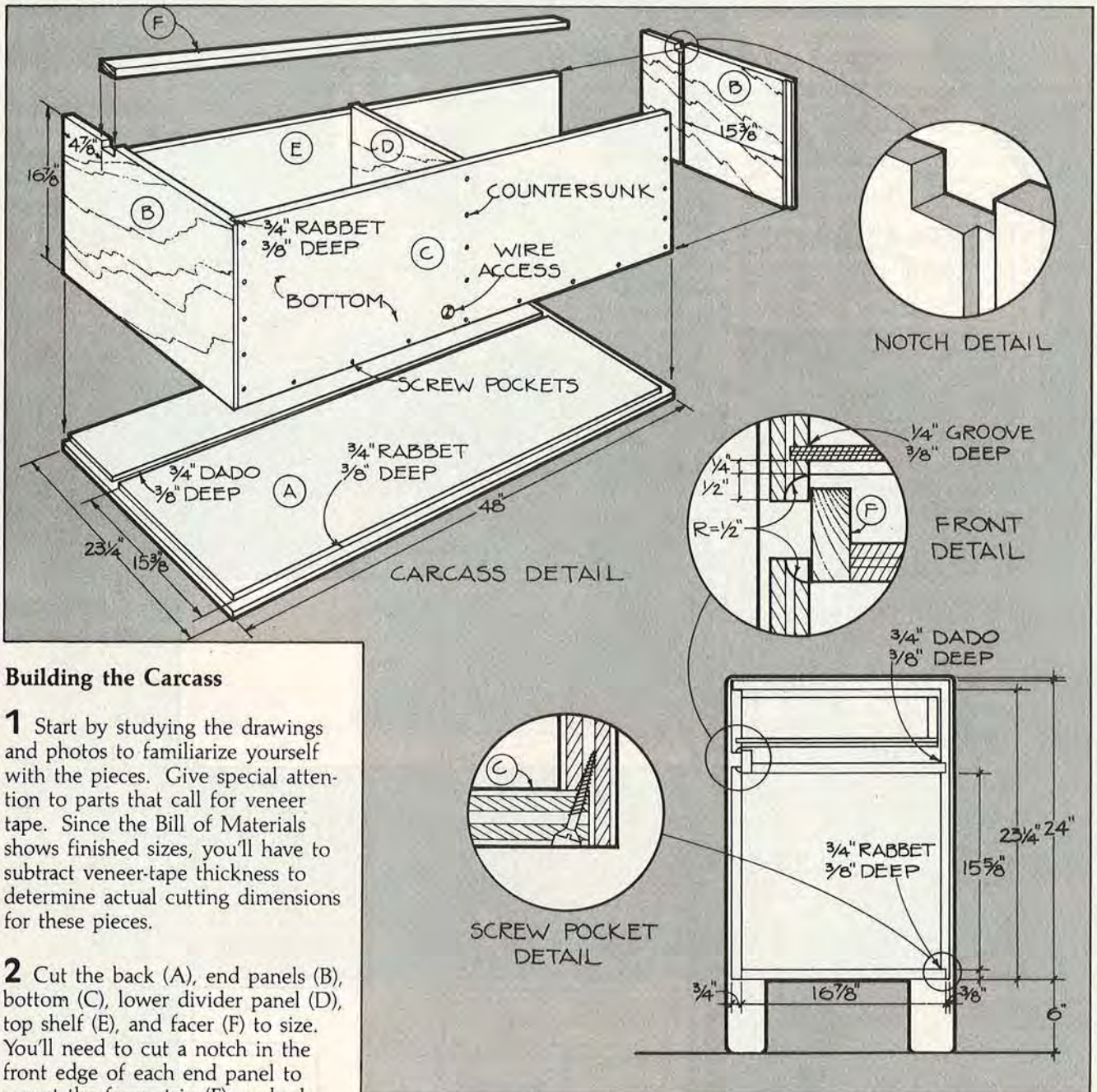
Part	Finished Size*			Material	Qty.
	T	W	L		
A	¾"	48"	23¼"	red oak plywood	1
B	¾"	16⅞"	23¼"	red oak plywood	2
C	¾"	16⅞"	47¼"	red oak plywood	1
D	¾"	16½"	15⅝"	red oak plywood	1
E	¾"	16⅛"	47¼"	red oak plywood	1
F	¾"	2"	48"	red oak lumber	1
G	¾"	16½"	6⅛"	red oak plywood	2
H	1⅛16"	3"	30¼"	red oak lumber	4
I	1⅛16"	3"	18½"	red oak lumber	2
J	¾"	16"	22¾"	red oak plywood	2
K	¾"	11 15/16"	16⅞"	red oak plywood	4
L	¾"	18"	23 15/16"	red oak plywood	2
M	¾"	23 15/16"	5¼"	red oak plywood	1
N	¾"	4¾"	16"	red oak plywood	2
O	¾"	4¼"	20¾"	red oak plywood	1
P	¼"	16"	20¾"	red oak plywood	1
Q	¾"	23 15/16"	5¼"	red oak plywood	1

*Dimensions of ¾" plywood include veneer tape on all exposed edges.

Supplies: woodworker's glue, 1 pair—side-mount door slides, 2 pairs—invisible hinges, 2 pairs—¾" concealed wraparound hinges, 12—#8 x 1½" flathead wood screws, magnetic door catch hardware, ¼" hardboard (for splines), red oak veneer tape, 8—shelf clips, 1 pair—counterbalance hinges, 25—#8 x 1¼" flathead wood screws, stain, varnish.


TURNTABLE CAVITY
VENEER TAPE
¾" DADO ⅜" DEEP
2"
NOTCH DETAIL
¾" RABBET ⅜" DEEP
¾" DADO ⅜" DEEP
1½" HOLE WIRE ACCESS
¾" DADO ⅜" DEEP
¾" X 1¼" NOTCH
#8 X 1½" WOOD SCREWS
RED OAK VENEER TAPE
¼" GROOVE ⅜" DEEP ¼" FROM BOTTOM
¾" RABBET ⅜" DEEP
CENTERING DETAIL
¾" X 1¼" NOTCH
3½"
COUNTERBALANCE HINGES
¼"
18"
18½"
¼"
TOP VIEW
R=¼"
THROUGH SPLINES
2"
45°
3"
3"
3"
18½"
END VIEW
1/16"
23 15/16"
1/16"
23 15/16"
R=¼"
2"
INVISIBLE HINGES
1 1/8"
5¼"
16⅞"
30¼"
2 1½"
6"
1/16"
11 15/16"
11 15/16"
11 15/16"
11 15/16"
1/16"
48"
50⅛"
FRONT VIEW

Continued



Building the Carcass

1 Start by studying the drawings and photos to familiarize yourself with the pieces. Give special attention to parts that call for veneer tape. Since the Bill of Materials shows finished sizes, you'll have to subtract veneer-tape thickness to determine actual cutting dimensions for these pieces.

2 Cut the back (A), end panels (B), bottom (C), lower divider panel (D), top shelf (E), and facer (F) to size. You'll need to cut a notch in the front edge of each end panel to accept the facer strip (F), and rabbets and dadoes in the end panels and back (see the Carcass Detail). Before cutting the dadoes in the end panels, measure the thickness of the top shelf (E). (The actual thickness of ¾" plywood is not always precisely ¾".)

3 Dry-clamp pieces A–F, check for correct fit, and adjust if necessary. While the pieces remain clamped, drill pilot holes and screw pockets for #8 × 1¼" screws to attach the bottom of the unit to the back and end panels. We used 5 evenly spaced screws to attach C to B, and 7 screws to attach C to A. For mounting the divider panel (D) between E and C, drill 4 countersunk pilot holes to attach E to D, and 4 to attach C to D.

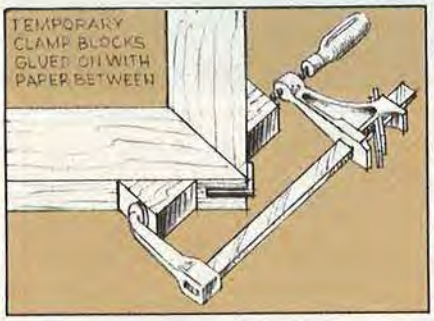
4 Glue, reassemble, and clamp the pieces together. Check for squareness, then install the #8 × 1¼" screws.

5 Cut and notch the upper divider panels (G) as shown in the Cutaway Drawing. Position them so their inside edges are centered over the lower divider panel (D), as shown in the Centering Detail.

6 Apply oak veneer tape to all exposed edges (see the Cutaway Drawing). Either iron-on edging or the type that adheres with contact cement will work well.

The Leg Assembly

1 Rip 1 1/16"-thick oak to 3" for leg parts (H, I). Miter both ends of each I and one end of each H to 45°, then crosscut all of them to length. Cut ¼"-wide grooves 1" deep in each mitered end of the six pieces and fit with ¼" spline material. Dry-clamp the legs together, checking for squareness and groove alignment. Glue, reassemble, and clamp the legs together, using clamp blocks as shown in the drawing below.

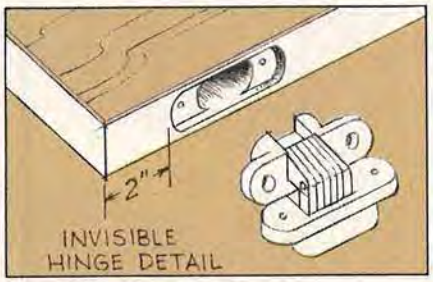


2 After the glue has dried, remove the clamps and clamp blocks. Sand excess spline material, then rout a ¼" round-over on all edges of the legs, including their bottoms (to prevent legs from catching on flooring material). Sand the legs smooth and fasten them to the cabinet with #8 × 1½" screws driven from the inside of the cabinet into legs.

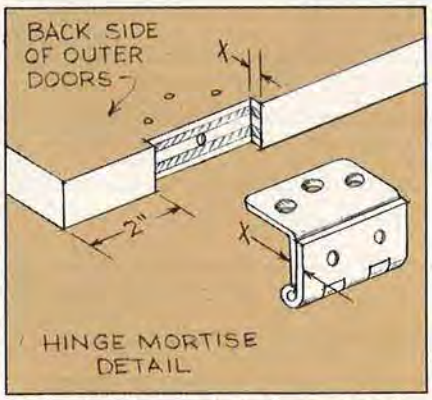
Installing the Shelves and Doors

1 Cut the adjustable shelves (J) to size, making sure that you allow clearance for shelf clips. Apply veneer tape to the shelf fronts. Measure and mark the holes for shelf supports or use a strip of perforated hardboard (the type with ¼"-diameter holes) as a template. Then drill ¼" holes ⅜" deep in the inside of the left end panel (B) and the left side of the lower divider panel (D). (We spaced the support holes 1" apart and 3" in from the front and back edges. To guard against drilling through the pieces, we wrapped a piece of electrical tape around the drill bit. Drill 1½" holes through C and E for wire access. The wires run behind the shelves (J).

2 Cut the four doors (K) to size, allowing for veneer tape and the necessary 1/16" clearance between the doors. Lay the doors in place to check for a good fit. (It's helpful here to put the cabinet on its back.) Mark location for magnetic door catch hardware and drill pilot holes if necessary. Apply veneer tape to all exposed edges. Using a router fitted with a cove bit, rout a hand pull in the top of the inner two doors. Make the pulls about 4" long and center them. Install invisible hinges between the inside and outside doors per manufacturer's instructions. (See Invisible Hinge Detail.)



To mount the door assemblies to the carcass, mortise the concealed wraparound hinges into the edges of the outer doors as shown in the

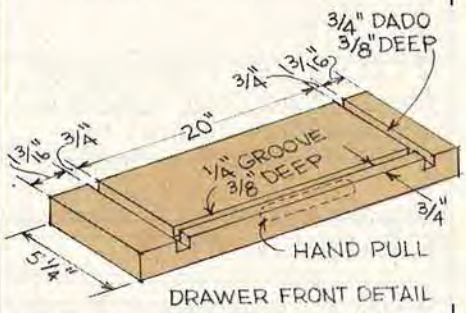


Hinge Mortise Detail above. Mark and drill pilot holes in the cabinet legs (H) for the wraparound hinges. Remove hardware and set all parts aside.

The Cabinet Top and Drawer

1 Cut the two cabinet top panels (L) to size, then test-fit them. Apply veneer tape to the front and side edges. Glue and clamp the right-hand panel in place. Use counterbalance hinges to install the turntable cavity top as shown in the photo below.

2 Cut the drawer pieces (M, N, O, P) to size. Rout a hand pull in the bottom of the drawer front. Cut the rabbet and groove in the drawer sides (N) as shown in the Cutaway Drawing on page 67, and the dadoes and groove in the drawer front (M) as shown here. Glue, nail, and clamp the drawer together. After the glue has dried, mount the drawer slides to the drawer sides and the cabinet carcass, following the instructions supplied with the slides. Apply veneer tape to all exposed edges of the drawer front.



3 Cut the turntable cavity front (Q) to size. Apply tape to its edges, then glue and clamp it in place, in line with drawer front (M).

4 Sand, then finish the unit as desired. (We used stain and polyurethane varnish.) Install all door hardware, then hang the doors. ■

SIMPLE cabinet desk

A sturdy laminated work surface and two variations of a basic cabinet produce a versatile desk for home or office.

Carcass Construction

1 Cut cabinet sides (A), cabinet backs (B), and cabinet bottoms (C) to size. (Since we designed our desk to sit against a wall, we chose hardboard for the cabinet backs. If your desk will be placed away from the wall, substitute ¼" oak veneer plywood for the hardboard.) To prevent veneer from chipping on flooring material, rip ⅛" strips from ¾" red oak for base strips (D), and glue and clamp D to the bottom edges of A.

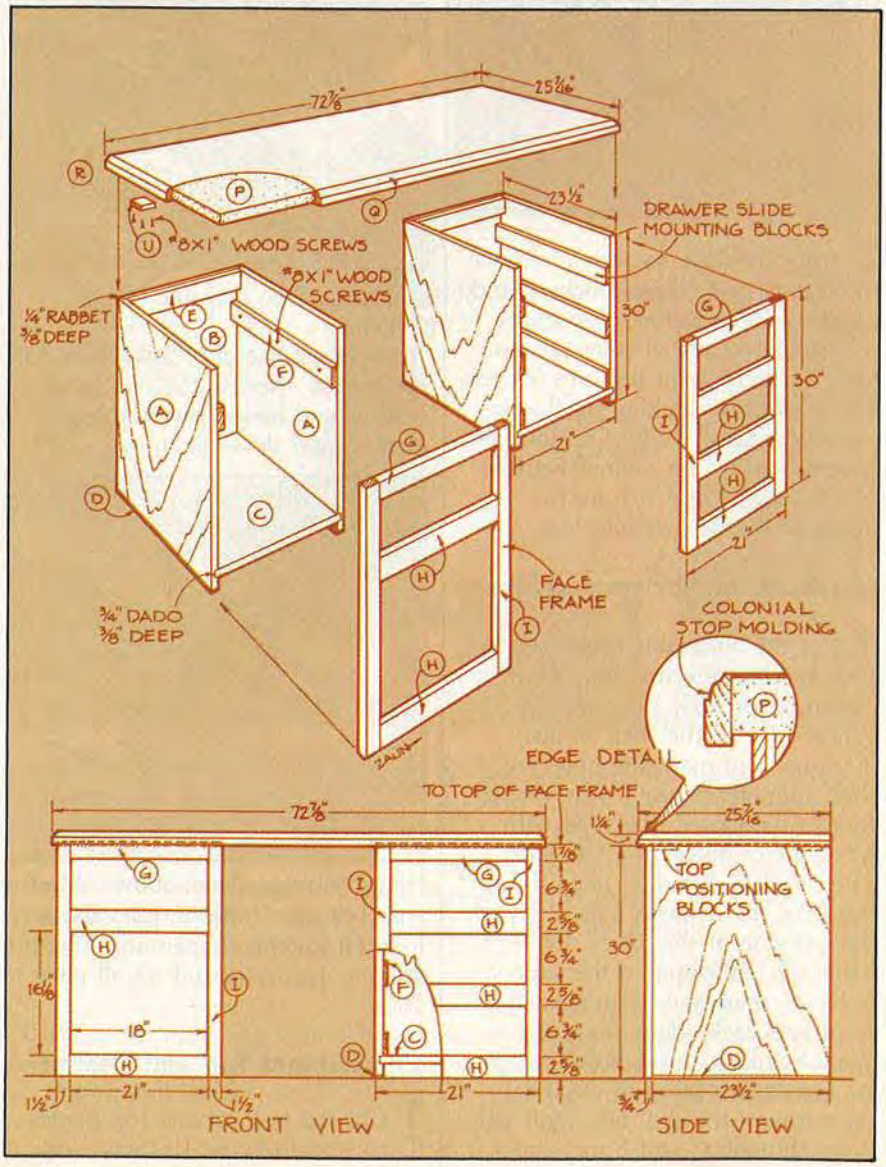
2 Cut a ¾" dado ⅜" deep and 1⅞" from the bottom edge of the A–D side assemblies to receive C. Cut a ¼" rabbet ⅜" deep in the back of the A parts to receive B. Cut the ledgers (E) and the drawer-slide mounting blocks (F) to size.

3 Glue and clamp parts A, B, and C together to form the two cabinet carcasses. Check for square with a framing square. Nail and glue E in place, flush with the top edge of the cabinet backs (B).

Assembling the Face Frames

1 Cut the face frame rails (G, H) to size. Rip the stiles (I) to size plus 1/16" so that the face frames will be slightly wider than the cabinet carcasses at this point. (Later, when you attach the frames to the cabinet carcass, you'll sand them flush for a perfect fit.) Cut I to length.

2 Doweled butt joints secure the rails to the stiles. First, lay out parts



G, H, and I on a flat surface in the arrangement in which they will be glued. Then, use pipe clamps to dry-fit the face frame parts. Mark the dowel locations. (We used a try square and pencil to mark reference lines on the end of each rail and adjoining stile. See the Doweling Diagram on page 72.)

3 Drill two ⅜" holes 13/16" deep in each rail end, then drill like-sized

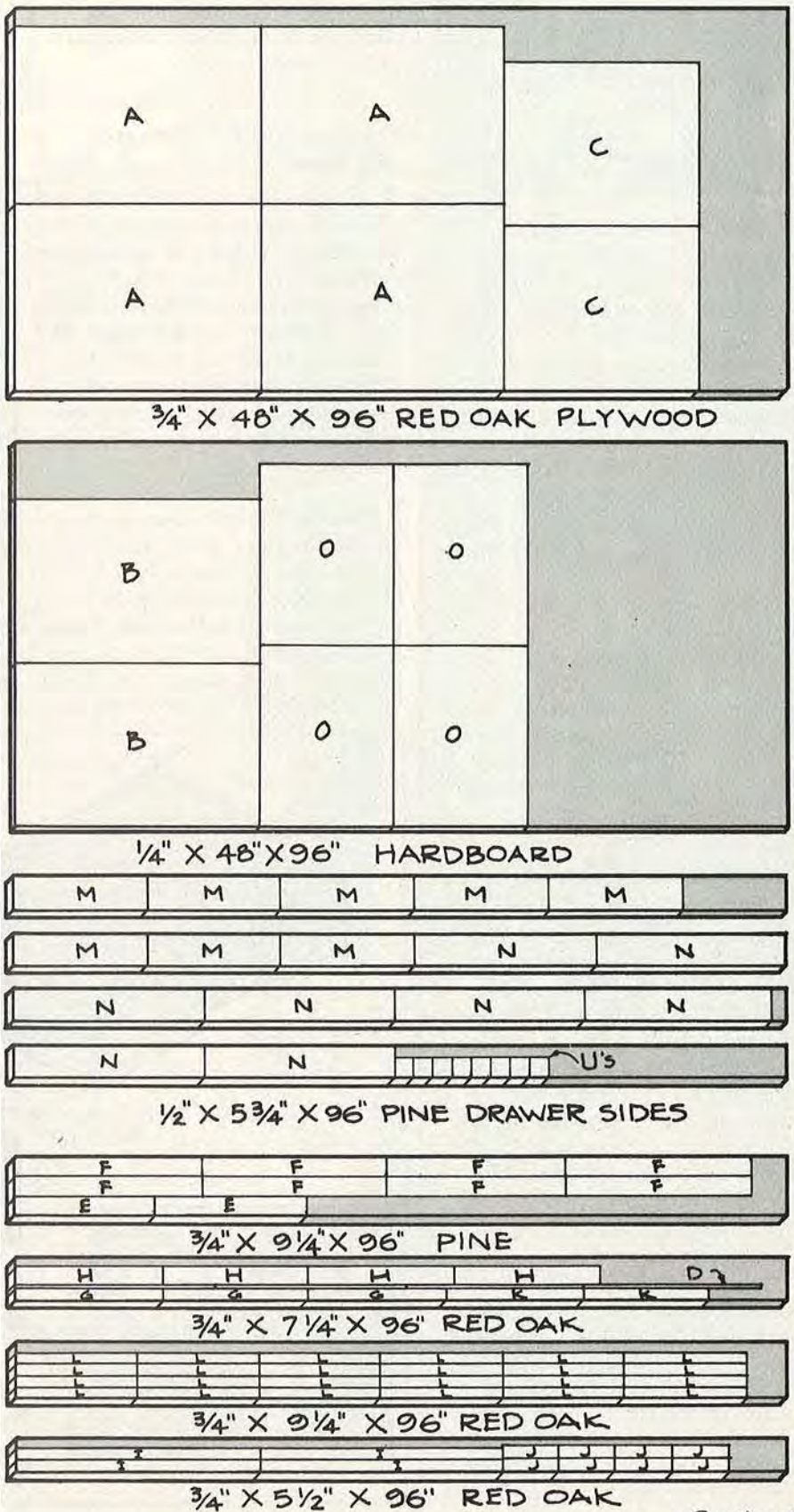
Bill of Materials

Part	Finished Size* T	W	L	Material	Qty.
A	¾"	23½"	29⅞"	red oak plywood	4
B	¼"	20¼"	29⅞"	hardboard	2
C	¾"	20¼"	23¼"	red oak plywood	2
D	¾"	⅛"	23½"	red oak	4
E	¾"	2"	19½"	pine	2
F	¾"	3"	23¼"	pine	8
G	¾"	1⅞"	18"	red oak	2
H	¾"	2⅝"	18"	red oak	5
I	¾"	1½"	30"	red oak	4
J	¾"	1⅞"	7½"	red oak	8
K	¾"	1⅞"	16⅞"	red oak	2
L	¾"	1⅞"	15½"	red oak	25
M	½"	5¾"	16½"	drawer-side mat'l	8
N	½"	5¾"	23"	drawer-side mat'l	8
O	¼"	16½"	22½"	hardboard	4
P	13/16"	25"	72"	particle-board	1
Q	1/16"	25"	72"	plastic laminate	1
R	3/64"	25"	72"	balance sheet	1
S	7/16"	1⅜"	72⅞"	red oak molding	1
T	7/16"	1⅜"	25 7/16"	red oak molding	2
U	¾"	3"	3"	pine	8

***Some parts are cut larger initially, then trimmed to finished size. Please read instructions before cutting.**

Supplies: ⅜" × 1½ dowels, 6 drawer pulls, 4 pairs 22" drawer slides, 1 pair self-closing overlay door hinges, 56—#8 × 1" flathead wood screws, 4d and 6d finishing nails, contact cement, waxed paper, wood putty, finish of your choice.

Cutting diagram



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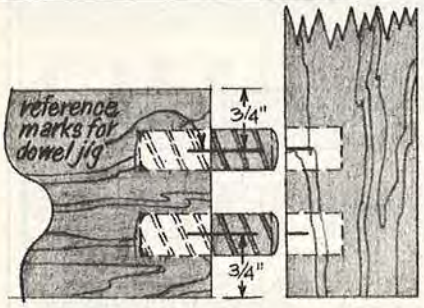


holes in the stiles. (We used a doweling jig to ensure that our dowels were in line with the reference marks and centered on the ¾" oak edges. Since it is risky to dry-fit doweled joints—they tend to break or stick—it is important to mark and drill the holes accurately.)

4 Once you've drilled all the holes, use a small brush to apply glue to the dowels, dowel holes, and mating surfaces. Glue and clamp both face frames together on a flat surface, and check that the assemblies are square and flat.

5 After the glue has dried, remove the clamps and scrape off the excess glue. Sand the front and back of each frame flush. (Even the best laid-out dowel joints seem to come out a little uneven.)

Assembling the Cabinets

1 Glue, clamp, and nail the cabinet face frames to the cabinets. (We used 6d finishing nails to help position and attach the frame to the cabinet.) (See the tip on page 36 for how to avoid splitting the face frame as you nail.) The outside edges of each face frame will extend slightly beyond the carcass.

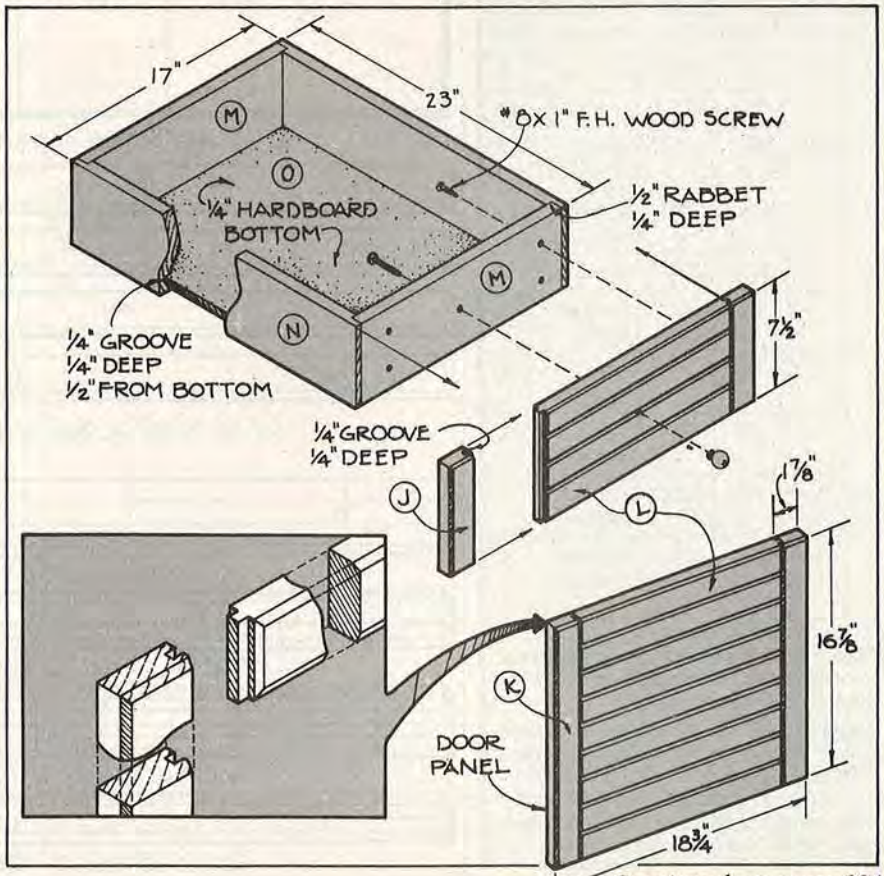
2 Sand the face frames and base strips flush with the carcass. Don't sand through the veneer!

3 Position the drawer-slide mounting blocks (F) on the cabinet sides. Make sure the bottom of the blocks align with the top edge of the face-frame rails (H). (See the cutaway portion of the Front View.) The blocks should also mount flush with the inside edge of each face-frame stile (I). If the blocks are too thick, they can be sanded or jointed to proper size. We used glue and three—#8×1" wood screws to attach each mounting block to the cabinet sides.

Constructing the Drawers and Door

1 To make the 4 drawer fronts and 1 door front, rip the stiles (J, K) to width, then rabbet a ¼" groove ¼" deep along one edge of each stile to accept the rails. (You can cut the rabbet with a router, table saw, or radial arm saw.) Cut J and K to length. Cut the rails (L) to size, then rout a ¼" rabbet ¼" deep on each side of each end of L to form a ¼" tongue.

2 Chamfer all face edges of the drawer and door front parts (J, K, L). (A table saw works well for cutting the ends and sides of the parts.) To chamfer the ends, clamp a stop to a fence mounted on the table saw's miter gauge, and tilt the saw blade to 45° as shown in the photo below. (In both the photos below, we've removed the blade guard for photographic clarity.) To cut the rip-chamfers, position the saw's rip fence away from the blade



—Continued on page 104

DADO BLADES & SETS

Getting in the Groove

You can spend $25 or pay $300 to equip your radial arm or table saw with a dado accessory. What will you get for your money? What do you need?

Your plans call for a ¾" groove, ⅜" deep. If you use your normal saw blade, its ⅛" kerf will require you to make at least 6 passes to do the job. And if the groove must be 52" long . . . well, maybe you should turn on the basketball game and build the cabinet next weekend.

But what if you had a dado accessory, a device for cutting channels in wood that would make quick and safe work of dadoes, grooves, rabbets, and tenons?

Instead of positioning and repositioning your workpiece, you could set the dado head to the proper width, make one pass (or perhaps two if you were making an extra deep cut), finish the cabinet, and *still* watch the game.

Do You Really Need One?

For a specialized shop accessory, a dado assembly isn't cheap, so ask yourself if you'd use the device often enough to justify buying it. If most of your projects don't involve cutting a lot of grooves, you probably *can* survive by making repeated passes with a standard saw blade, or by making a few passes and then chiseling out the waste. You can also achieve excellent results with a router.

But if you plan to do a substantial amount of work that calls for various types of grooves—a wall of bookshelves, say, or a set of kitchen cabinets—then you'll certainly appreciate the speed and precision that a good dado accessory offers, and purchasing one probably makes sense.

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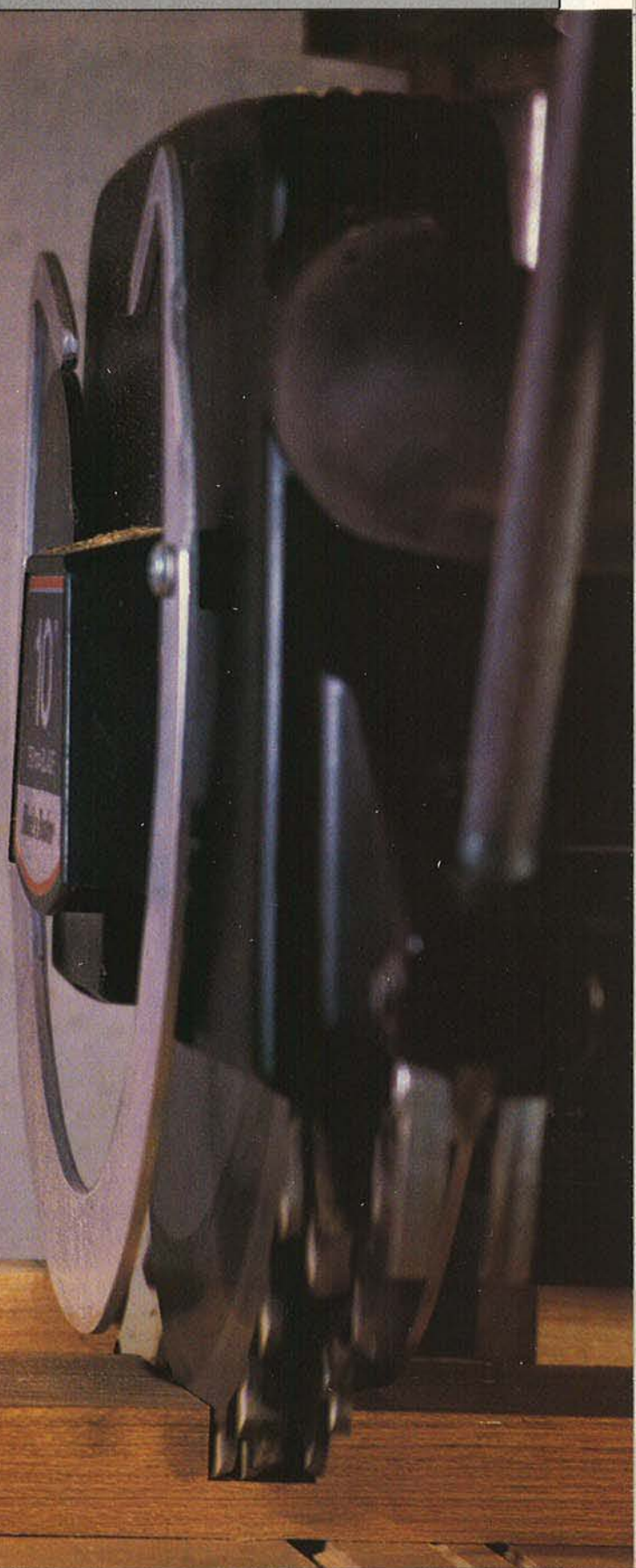


The Bottom Line

You'll encounter many variables as you make your choice. There are various types of dado assemblies, composed of different materials. They are constructed with numerous blade grinding techniques and tooth configurations, and sold at a wide range of prices.

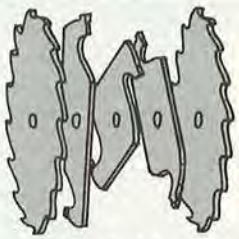
But all you're really interested in is how well the thing works and how much it's going to set you back. So those should be the key points to consider as you approach your buying decision.

Stackable Sets Vs. Adjustables

Dado tools come in two general types. A *stackable dado assembly* consists of two outside *cutters* and from two to five inside *chippers.* The outside cutters slice the wood, scoring and perforating it to define the edges of the channel. The width of the groove is determined by adding or subtracting the inside chippers, which shear and remove material from the center of the cut, acting much like revolving wood chisels.

An *adjustable or "wobble" dado blade* is a single blade equipped with offset teeth. The blade revolves on a hub and spins eccentrically. Viewed head-on, its motion

Types of available dado tools. Clockwise from lower left: a flat-ground steel dado stack set with interchangeable outside cutters and 5 chippers; a thin-rimmed steel stack set; a carbide-tipped steel adjustable dado blade; a carbide-tipped steel stack set.



Stackable dado assembly

Adjustable dado blade

creates an hourglass pattern, as the single set of cutting teeth slants from side to side to cut the groove. Adjusting the hub alters the range of this lateral travel, and thus the width of the dado.

Comparing the Two Types

Dado assemblies of either type will cut kerfs up to $^{13}/_{16}$" wide and $^{3}/_{4}$" deep in one or two passes (depending on the wood and the depth of the groove), but how well—and how quickly—they do the job varies all over the lot.

Because stack sets slice the wood, while adjustable dado blades more or less chop away at it, stackable assemblies tend to make the neatest cuts. The difference may not be too great in solid lumber, but does show up more often in plywood, where adjustable blades exhibit a greater tendency to chip or tear thin face veneers.

Since adjustable blades pivot from side to side, their cutters travel along an arc, and the bottom of the groove they cut isn't perfectly flat. This can cause problems when you try to square a cabinet as you assemble it. You could use a hand router to even things out, but you'd sacrifice speed in the process—one reason you considered buying a dado assembly in the first place.

In addition, since the adjustable blade not only has to move forward, but from one side to the other as well, the rate at which stock can be fed tends to be slower than with stack assemblies.

Before you dismiss adjustable dado blades entirely, however, consider two of their merits: they allow infinite kerf-width settings within their limits, and they're simpler to install and adjust than stack sets.

To set the width on an adjustable blade, you simply turn a dial on the hub. With a stack set, you must disassemble the dado head, add or remove chippers (and paper or cardboard washers for more precise adjustments), and then put the set back together.

Considering Carbide Blades

Any dado assembly must be sharp to work effectively. If the chippers on a stackable set dull before the outside cutters, for example, they may "hammer" the wood rather than pare it away.

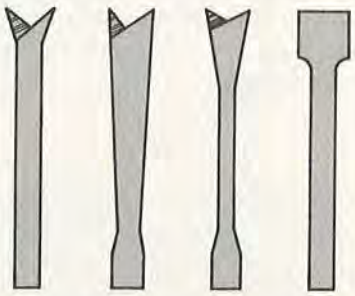
Blades with carbide teeth stay sharp substantially longer than regular steel blades, offering smoother cuts in the process. Their extra initial cost may be offset by subsequent savings, since they won't have to be resharpened as frequently.

You'll find both stackable dado sets and adjustable blades offered with carbide teeth. If the carbide tips are long enough, the blade can last a lifetime.

Some manufacturers market chromium-plated blades, which they say hold an edge better than regular carbon steel, won't scratch, and are less likely to become clogged with pitch. One manufacturer, U.S. Saw Corp./Oldham Saws, even guarantees that the blade body won't rust.

Grinding Makes a Difference

To prevent binding and overheating, a saw blade must cut a kerf wider than its body. Brazed-on carbide teeth accomplish this by being wider than the rest of the blade,



Styles of dado blade bodies. Left to right: flat ground; hollow ground; thin rim; carbide tip or *swedge.*

Continued on page 102

WOOD tests 14 popular dado accessories

We set out to test widely available dado accessories —both adjustable blades and stackable sets. Since dado blades should be at least 2" smaller than other saw blades, and since 10" table saws seem to be the most popular models among home woodworkers, we restricted our choices to dado assemblies with diameters of 8" or less and gathered 14 different models. (Some manufacturers chose not to participate.)

We used a 1.5 hp. Rockwell Model 10 table saw to test each dado tool. We ran stock through the saw at six to eight feet per minute, adjusting this feed rate when it was apparent that slower speeds would produce better cuts.

We selected test cuts to approximate the steps a woodworker might take in constructing a bookcase 8' long × 4' high × 1' deep with a middle divider and two end panels, all joined with dadoes. The cutting sequence was:

Cuts 1 and 2: Dado and then groove 12" of ¾" birch plywood.

Cuts 3 and 4: Dado and then groove 12" of ¾" red oak plywood.

Cut 5: Groove 20' of poplar lumber.

Cut 6: Groove 18' of red oak lumber.

Cuts 7–10: Repeat cuts 1–4 for before and after comparisons.

We noted each product's performance in every sequence detailed above, a synopsis of which appears below each test photograph. The photos show the actual cuts each tool produced the second time across and with the grain in red oak plywood.

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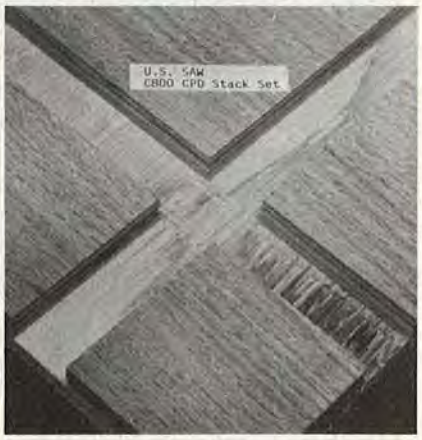
Black & Decker / Model 73-560
Flat-ground steel, 6" stack set. Interchangeable cutters have 30 teeth, 5 rakers each; 5 chippers have two teeth each. Retail price: $24.99. Micro burrs on teeth had to wear off before good cuts were achieved. On second pass, birch plywood was damaged. Good cuts in oak plywood. No chipped lumber edges. Very slow feed.

Sears / Model 9-32475
Flat-ground steel, 8" stack set. Interchangeable cutters have 40 teeth, 8 rakers each; 5 chippers have 2 teeth each. Retail price: $32.99. Veneers splintered across the grain in plywoods, but not with the grain. In all lumber cuts, this tool left saw marks on sides of kerf and ridges in the bottom. Small tear-outs when grooving lumber.

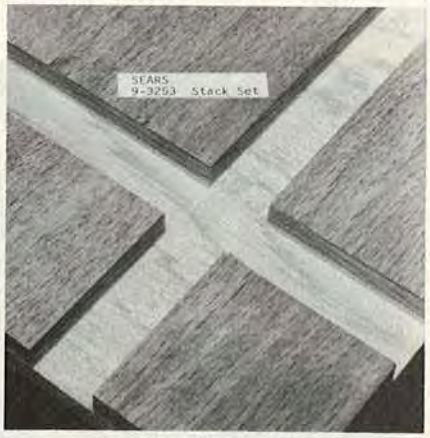
Sears / Model 9-3263
Carbide adjustable, 7" with 16 teeth. Retail price: $34.99. Even at a slow feed rate of 3–4 feet per minute, it chopped and splintered plywoods. To get a decent cut, we had to make gradually deeper passes. In grooving lumber, the blade left saw marks in the sides, chipped the edges, and hammered (a vibration that you can hear and feel) the grain.



U.S. Saw Corporation / Oldham Saws / Model C-800 CPD
Steel flat-ground, 8" stack set. Interchangeable cutters with 48 teeth, 4 rakers each; 4 chippers have 2 teeth each. Retail price: $41.04. Perfomed well in plywood and lumber, although dadoing had to be done very slowly (2–3 feet per minute). Saw marks on sides of grooves in lumber.

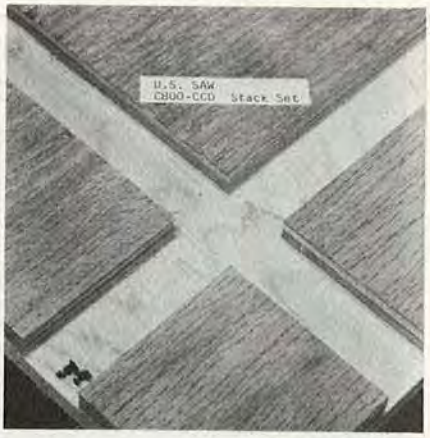
Continued

Sears / Model 9-3253
Steel thin-rim, 8" stack set. Interchangeable cutters with 128 teeth (no rakers) each; 5 chippers have 2 teeth each. Retail price: $42.99. Plywood cuts had smooth sidewalls, but some veneer chips. Plywood cut better after assembly did the lumber cuts. Sides and bottoms in lumber were good, but tool started to burn stock during last few feet of feed cycle. Tiny ridges were noticeable in bottom of groove.



Sears / Model 9-3261
Carbide adjustable, 7" with 24 teeth. Retail price: $44.99. Plywood was damaged during across the grain cuts even when fed at a rate slower than 2 to 3 feet per minute. Hammering was evident while cutting lumber, and grooves showed edge chipping, all at 2 to 3 feet per minute feed. More occurred at faster feed rate. Cuts improved with use of repeated pass technique.

Sears / Model 9-3262
Carbide adjustable, 7" with 32 teeth. Retail price: $49.99. Satisfactory cuts in veneer plywood required feed rate of 3 to 4 feet per minute, either with the grain or across it. In the cuts with poplar and red oak lumber, we maintained the above rate and the blade vibrated somewhat, hammered, and left saw marks on sides of cut. Some chips on edges of kerf were produced, but not significant.



U.S. Saw Corporation / Oldham Saws / Model C-800 CCD
Carbide/steel, 8" stack set. Interchangeable cutters have 18 teeth each; 4 chippers have 2 teeth each. Retail price: $96.41. This set produced a very nice cut on the first pass through birch plywood, but the second pass produced chips. It did not cut well in oak plywood either with or across the grain. Cuts in poplar and oak lumber were very good, with only minor grain tears.

Everlast Saw & Carbide, Inc. / Model DS-8 #3
Carbide/steel, 8" stack set. Non-interchangeable cutters have 18 teeth each; 4 chippers have 2 teeth each. Retail price: $162.25. Left tiny chips in birch plywood, very few across the grain in oak plywood. No chipping in cuts with grain of plywood. Nearly perfect cuts in lumber. Cutters run slightly deeper to leave "glue slots" in dadoes to lessen glue squeeze-out.

Freud USA / Model DS-308
Carbide/steel, 8" stack set. Non-interchangeable cutters have 18 teeth each; 4 chippers have 2 teeth each. Retail price: $179.95. Left-side cutter chipped plywood across grain on both passes, left tiny nicks on second pass with grain. Lumber cuts very good, with nice sidewalls. Lots of carbide on tips for extended blade life. Unit cuts well at a faster speed rate than others (6 to 10 feet per minute).

U.S. Saw Corporation / Oldham Saws / Model C-800 CHD
Steel hollow-ground, 8" stack set. Interchangeable cutters have 48 teeth, 4 rakers each; 5 chippers have 2 teeth each. Retail price: $60.48. Vibrated excessively and cut poorly so returned to manufacturer for tests. Replacement received too late to photograph, but cuts showed only slight chipping across grain, smooth cuts with grain in plywood.

Freud USA / Model AD-800
Carbide adjustable, 8" with 26 teeth. Retail price: $62.90. Manufacturer says it's not recommended for plywood, and we agree, as it chipped badly on cross-grain cuts unless fed at 2 to 3 feet per minute. Lumber cuts in poplar and oak, if done slowly, were clean and neat, with only minor side-burning of groove. This blade has a very thick hub which only allowed us a few turns of the nut on the arbor.

Sears / Model 9-3264
Carbide/steel, 8" stack set. Interchangeable cutters have 22 teeth; 6 chippers have 2 teeth each. Retail price: $89.99. Original chippers in set not bored out large enough to fit saw arbor. Replacement chippers cut shallower than outside blades so bottoms were uneven. Set produced very poor cuts in lumber and across grain in plywood even at a severely reduced feed rate of less than 2 feet per minute.

Forrest Manufacturing Co., Inc. / "Mr. Sawdust" Dado King #3
Carbide/steel, 8" stack set. Non-interchangeable cutters have 24 teeth each; three ⅛" chippers have 4 teeth each, one ¼" chipper has 8 teeth. Retail price: $299. Minor chipping in oak ply across grain. Glass-smooth dado sides. Excellent lumber cuts if feed rate reduced slightly. Multi-toothed chippers produced neat, clean, no-mar dadoes and grooves.

Looking at our test results, you may ask, "Why buy *any* of these accessories if even the best won't cut perfectly in every situation?" We share your concern. Chips, however small, were left in plywood by even the most expensive dado accessories.

Acting on the advice of Jim Boelling, our Project Builder, we contacted the experts—not dado blade experts but plywood experts—and discovered two good reasons for our test results: plywood veneers are getting thinner, and plywood adhesives are getting stronger. The combination makes it more difficult today than ever before to cut clean, chip-free dadoes. Thinner veneers chip more easily. Improved adhesives that are much more durable than the wood itself make it harder for a dado blade to shear material cleanly.

Here are some tips that may help you combat these problems:

- Never force-feed your dado accessory. Feed stock only as quickly as the blade allows.
- Apply strips of masking tape to the plywood over the area of the dado, then cut through the tape. We've found that this procedure improves our cuts in many situations.
- Because of its rotary cutting action, a router may be less apt to tear thin veneers than a dado accessory under certain conditions. But you're more likely to require successive passes to achieve proper width and depth with a router, a process that increases your chances of making errors. Whenever possible, we think it's best to make cuts with a single pass.

Plywood veneers probably won't be getting any thicker in the future. Learn how to cope with thin-skinned materials now. ■

choosing the right clear finish for your project

You've swept the shop clean, waited for the glue to dry, and now your masterpiece sits there in all its wooden nakedness. The grain is beautiful. The craftsmanship top rate. So what are you going to do to it now? What type of finish will you select? How much more time do you want to spend? Read on for answers that will help you decide.

Print this article

Most woodworkers would rather spend their time making sawdust than thinking about which finish to use on their projects. That's understandable, but unfortunate because the finish you apply to your creation is vitally important. A clear finish enhances the appearance of the piece as well as protects the wood against moisture, dust, and wear.

Shopping for wood finishes these days isn't easy. A surprising array of products compete for your attention and your dollar. Therefore, the more you know about clear finishes, and what they'll do, the easier the selection process will become.

FACTORS AFFECTING YOUR CHOICE

When it's time to finish your project, you can narrow your choices somewhat by asking yourself these questions:

1. ***How and where will the project be used?*** A dining room table, for example, requires a very durable finish to withstand the spills and constant wear it will encounter in use. A picture frame, on the other hand, won't need as much protection.

2. ***Should it have a natural-looking, low-sheen finish that accents the texture and grain of the wood, or a finish with depth that can be polished to a very high luster?*** Even though appearance is largely a matter of personal preference, the design itself and the type of wood used should help you make the decision.

3. ***How much time and effort are you willing to expend applying the finish?*** While some finishes are easy to work with, others require more skill and equipment to apply correctly.

Until you have some experience with a finish, it's not possible to know for sure if you'll like what it does to a certain wood species. For this reason, always test the finish you select first on scrap.

THE TWO CLEAR-FINISH CATEGORIES

Clear finishes today fall into one of two categories: *penetrating* finishes and *surface* (or built-up) finishes. The penetrating ones — tung oil, linseed oil, Danish oil, mineral oil, and salad bowl finishes — soak down into the pores of the wood, forming a finish that resides in the wood itself. You wipe these on with a cloth or the palm of your hand, which makes the application practically mistake-proof.

Not surprisingly, surface finishes — natural varnish, polyurethane varnish, shellac, lacquer, and latex

Continued

finishes — lay on top of the wood surface, and build up with successive coats. These either brush or spray on and usually require the use of abrasives to rub out and polish the final surface.

TYPES OF SURFACE FINISHES

Natural Varnish. This product, made from natural resins (secretions), has been used by woodworkers for years. In fact, much of the furniture you see in antique shops was probably originally finished with natural varnish because of its ability to render a durable finish capable of resisting water, alcohol, and wear. Varnish is also easily brushed on and rubbed out. Because of its amber color, it gives wood a deep, rich-looking tone.

Unfortunately, natural varnishes dry very slowly (24–48 hours.) Dust problems and the faster-drying synthetic varnishes have nearly eliminated natural varnishes. Except for marine and spar varnishes, which are for exterior use, you may even have a difficult time finding a supplier that carries one.

Synthetic Varnish. Most varnishes today contain the newer synthetic resins and are known as polyurethane varnishes. These finishes have become quite popular with professional woodworkers and home hobbyists because they're durable, moisture-resistant, and fast-drying. They also give wood the same warm tone and depth as natural varnishes. Keep in mind, though, that these extremely hard surfaces require more effort to rub out and to polish than some of the other finishes. Varathane (Flecto), Defthane (Deft), and Zar Polyurethane (Beverlee's) are three commonly available products in this category.

Paste Varnishes. Varnishes such as Velvit Poly Gel, Heritage Paste Varnish, and Bartley Paste Varnish offer another option when choosing a polyurethane finish. These finishes resemble petroleum jelly in consistency and are easy to apply with a rag. They share all the advantages of polyurethane finishes, without the brush mark and settling dust problems normally associated with brushed or sprayed-on types. Because they form a thin finish with little surface buildup, poly paste varnishes create a natural-looking, low-sheen finish.

Shellac. This finish has been used for centuries, but since it produces a relatively brittle surface with low resistance to heat, moisture, alcohol, and abrasion, you should apply it only to items that will receive little wear and exposure.

At one time, it was a favorite finish for fine furniture because it was fast-drying, easy to apply, and polished to a high luster. Its numerous disadvantages make it a less popular choice today.

Even though shellac has been replaced largely as a wood finish, it's still used as a sealer over resinous knots to prevent stain and paste fillers from bleeding into certain finishes, such as lacquer. Parks Pure Shellac and Bull's Eye Shellac are two brands available.

Lacquer. The fast-drying champion of finishes, lacquer is used extensively in the furniture manufacturing industry. Many companies manufacture lacquer, but those most commonly available include Deft, Parks, and Behlen. Though not quite as durable as varnish, lacquer does produce a moisture and wear-resistant finish that polishes easily to a lustrous sheen. Because of the rapid drying times (approximately 30 minutes), you'll find spraying the most effective way to apply lacquer. Slower-drying, brushing lacquers such as Deft Clear Wood Finish and Pratt and Lambert's Wisk On make lacquer more practical for the home craftsman. Brushing lacquers still dry quickly, so restrict their use to small projects in which you can cover the entire surface in a short time.

Because lacquer is incompatible with most other finishing materials, you must use a sealer before applying lacquer to keep oil-based stains and fillers from bleeding through the finish.

Latex Finish. Finishes such as Wood Armor (Deft) and Benjamin Moore's Vaqua Kleer represent a new development in wood finishing. Though water-based, latex finishes form a surprisingly durable and water-resistant finish when cured. The absence of noxious odors and the convenience of water clean-up make them a joy to use.

Straight from the can, these products have a milky-white appearance that transforms into a clear film when dry. Because of this clarity, they lack the rich-looking tone produced by varnish, but the finish is appropriate where minimal color change is desired. You can brush latex finishes on easily, but they don't respond well to polishing or hand rubbing, so removing imperfections will be more difficult. Despite these shortcomings, in situations where ventilation or the use of traditional solvent-based products present a problem, latex finishes provide you with a viable alternative.

PENETRATING OIL FINISHES

Tung Oil. A centuries-old finish, that's enjoying great popularity today, tung oil comes in two forms — pure tung oil and polymerized tung oil. Of the two, polymerized dries much faster and has more luster. Both have a light golden color that imparts just the right amount of tone to accent the grain and texture of wood surfaces. And both form a moisture-resistant, durable coating that dries to a hard, solid film.

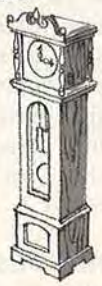
To apply tung oil, simply wipe it on with a cloth, let it set for several minutes, then remove the excess.

Several companies manufacture tung oil finishes — Southerland Welles, Formby, Parks, and the Hope Company.

Linseed Oil. Even though this old-time favorite yields a finish that looks "hand-rubbed," it has some shortcomings that limit its use. In addition to its tendency to deepen

Continued

WHEN TO USE WHICH CLEAR FINISH

Item type	Brand or Type Finish	Finish Category	Qualities
Toys	Watco Danish Oil	Penetrating	Nontoxic (after 30 days), durable and easily repaired, natural-looking, low sheen
	Behlen's Salad Bowl Finish	Penetrating	Durable, natural-looking, satin sheen
	Numerous Latex Finishes	Surface	Hard, durable, good depth, dries very clear
Food Contact Items	Behlen's Salad Bowl Finish	Penetrating	Highly resistant to moisture and food substances, natural-looking satin sheen, easily renewed
	Watco Danish Oil	Penetrating	Nontoxic (in 30 days), durable, easily renewed, natural-looking, low sheen
	Mineral Oil	Penetrating	Some moisture resistance, little wear protection, easily renewed, very low luster
Low-Use Furniture 	Lacquer	Surface	Moderately durable, rich-looking, easily polished to luster
	Latex	Surface	Good depth and durability, adds no tone
	Paste Varnish	Surface	Good durability, tones wood lightly, low build-up, hand-rubbed look, easily applied and repaired
	Tung Oil	Penetrating	Durable, moisture-resistant, non-darkening, low luster natural appearance, easily applied/renewed
	Danish Oil	Penetrating	Durable, easily repaired, warm tone, natural-looking, slightly more sheen than tung oil
	Oil/Varnish Mix	Penetrating	Extremely durable, natural appearance, easily, more protection and sheen than oil alone
Hard-Use Furniture	Polyurethane Varnish	Surface	Excellent durability, high moisture and wear resistance, good depth, various lusters, lightly tones wood
	Paste Varnish	Surface	Comparable to above in durability, less surface build-up, natural-looking, easily applied/repaired
	Oil/Varnish	Penetrating	Good durability, moisture resistance, satin luster, natural-looking, easily applied/repaired
Antiques	Oil/Varnish Mix	Penetrating	Good durability, hand-rubbed look, natural, satin luster, lightly tones wood, easily applied/repaired
	Paste Varnish	Surface	Hand-rubbed look with slight surface build-up, good durability, adds warm tone, easily applied and repaired
	Tung Oil	Penetrating	Durable, adds light tone, low luster, hand-rubbed look
	Linseed Oil	Penetrating	Some durability, deepens wood tone, very low luster, hand-rubbed look
Outdoor Projects	Spar or Marine Varnish	Surface	Exceptionally durable, highly moisture resistant, deepens wood tone, builds depth, high gloss
	Exterior Polyurethane	Surface	Durable and long-lasting, highly moisture-resistant, looks very similar to natural varnish
	Varathane Plastic Oil	Penetrating	Durable and long-lasting, easily renewed, satin sheen, natural-looking

Continued on page 121

cheval mirror

Old-fashioned elegance with lots of appeal.

Design: Kent Welsh Photograph: George Ceolla

Building the Mirror Frame

1 Rip the oak and walnut stock to width for parts A, B, C, and D. Cut the parts to length plus 1". Lay the pieces together on a flat surface in the arrangement that they will be glued and check for a good fit.

2 Glue and clamp the A-B and the C-D assemblies together sandwich-fashion. Space the clamps evenly about 4" to 5" apart to ensure an even, invisible glue line. (We spread the glue with an old playing card. Then we used bar clamps, alternating the clamps on the top and bottom of the pieces to prevent warping.) After the glue has dried, remove excess and trim the assemblies to their finished length.

3 Cut the corner blocks (E) to 3" square, with the grain running diagonally as shown in the Cutting Diagram. On a flat surface, fit all the frame parts together, then mark the location of the dowels that will join the corner blocks to the A-B and C-D assemblies. Drill ⅜" holes 13/16" deep.

4 Mark and cut the ½" inside radius on the E parts (See Detail 1). Sand this arc smooth, then glue and clamp the mirror frame together. After the glue has dried, remove the excess.

5 Mark and cut the outside radius on the E parts. Sand all surfaces and edges smooth.

6 Rout a ⅜" rabbet ⅜" deep on the backside of the frame for the mirror and backing. Square the corners with a chisel. Rout a ¼" round-over on all outside edges, then rout a ½" Roman ogee on the front inside edge. (See the Frame Corner Section.)

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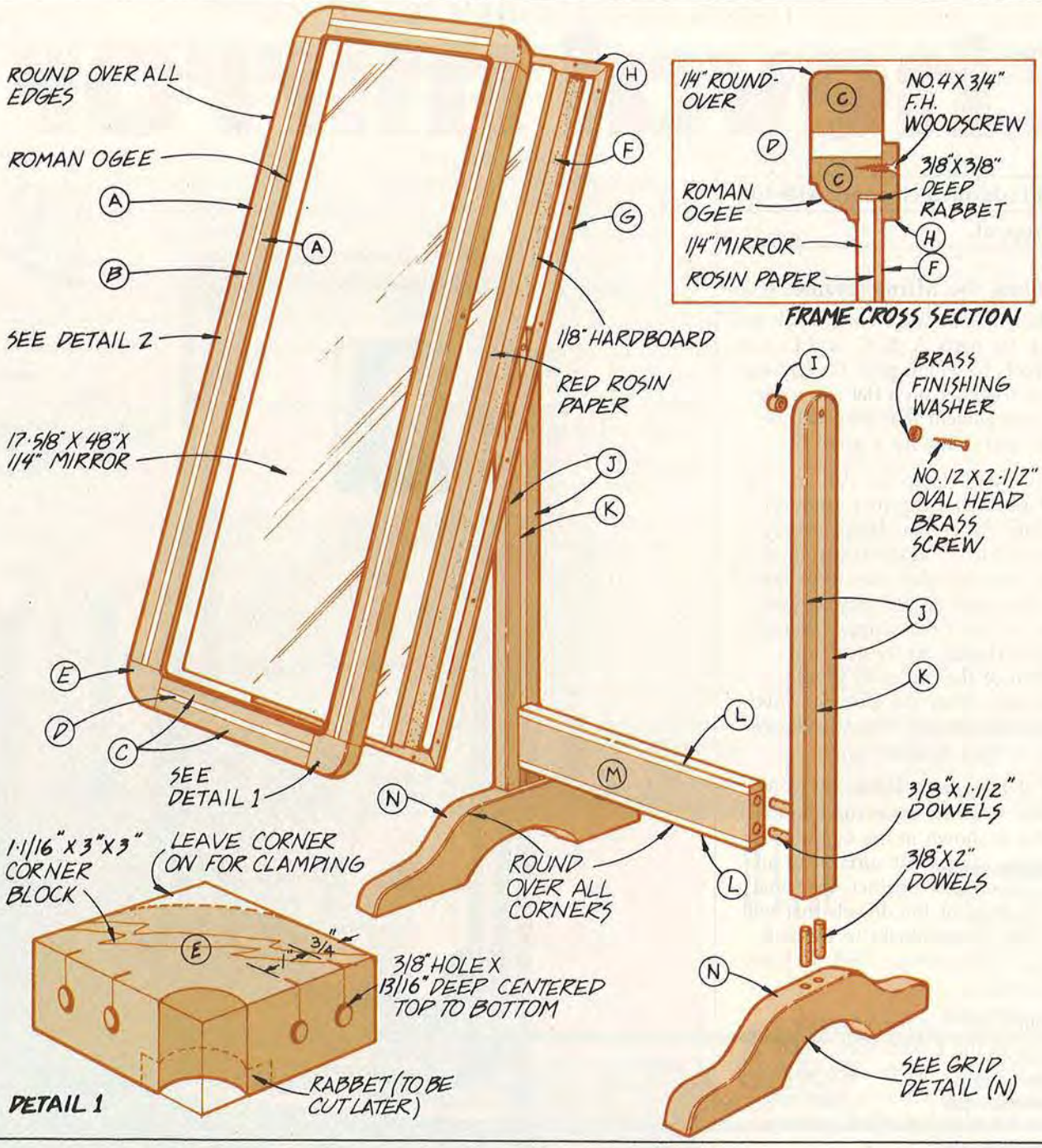

ROUND OVER ALL EDGES
ROMAN OGEE
SEE DETAIL 2
17-5/8" X 48" X 1/4" MIRROR
1/8" HARDBOARD
RED ROSIN PAPER
SEE DETAIL 1
ROUND OVER ALL CORNERS
1/4" ROUND-OVER
NO. 4 X 3/4" F.H. WOODSCREW
3/8" X 3/8" DEEP RABBET
ROMAN OGEE
1/4" MIRROR
ROSIN PAPER
FRAME CROSS SECTION
BRASS FINISHING WASHER
NO. 12 X 2-1/2" OVAL HEAD BRASS SCREW
3/8" X 1-1/2" DOWELS
3/8" X 2" DOWELS
SEE GRID DETAIL (N)
1-1/16" X 3" X 3" CORNER BLOCK
LEAVE CORNER ON FOR CLAMPING
3/8" HOLE X 13/16" DEEP CENTERED TOP TO BOTTOM
RABBET (TO BE CUT LATER)
DETAIL 1

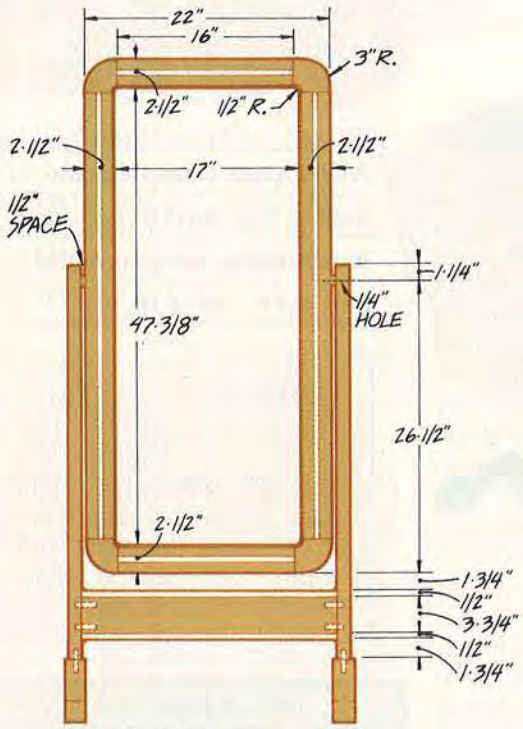
7 Cut the hardboard backing (F) and the mirror stops (G, H) to size. Drill ⅛" pilot holes through the walnut pieces (G, H) (see the drawing for positioning). Form I, using either a walnut dowel or a walnut plug, then drill a ¼" hole through the center.

How to Make the Stand

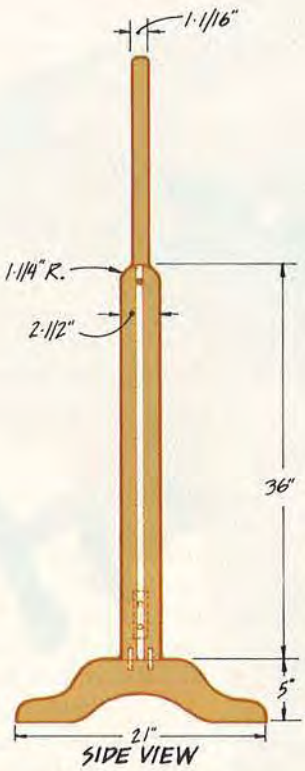
1 Rip parts J, K, L, and M to width. Laminate the vertical supports (J, K) and the cross support (L, M) as you did the frame parts in step 2 earlier. After the glue has dried, trim to the finished length.

2 Mark and cut a 1¼" radius on one end of each vertical support (J, K), and drill two ⅜" dowel holes 1 1/16" deep in the opposite end of each. Drill a ¼" hole through each upright at the center point of the radius. Center and dry-clamp the cross support between the uprights. Mark the location of the dowel holes on the uprights and cross support. Drill two ⅜" dowel holes 13/16" deep in each end of the cross support and corresponding holes in one side each of the vertical supports.

3 Cut the mirror's legs (N) to 5" × 23". Then, while the pieces still have a flat bottom and top, center an upright on each leg and mark



FRONT VIEW



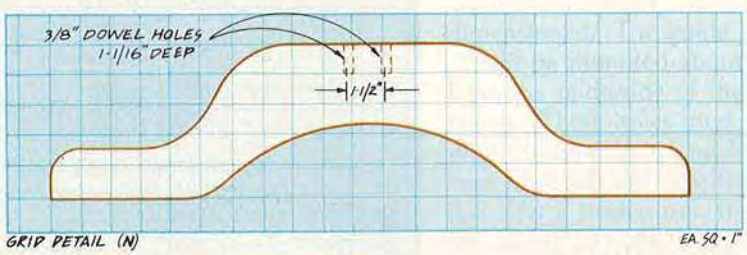
SIDE VIEW

Bill of Materials					
Part	Finished Size*			Material	Qty.
	T	W	L		
A	1 1/16"	1"	46 3/8"	walnut	4
B	1/2"	1 1/16"	46 3/8"	oak	2
C	1 1/16"	1"	16"	walnut	4
D	1/2"	1 1/16"	16"	oak	2
E	1 1/16"	3"×3" diag. cut		walnut	4
F	1/8"	17 5/8"	48"	hardboard	1
G	1/4"	1 1/4"	50 1/4"	walnut	2
H	1/4"	1 1/4"	19 1/2"	walnut	2
I	3/4" dia. × 1/2" long			walnut	2
J	1 1/16"	1"	36"	walnut	4
K	1/2"	1 1/16"	36"	oak	2
L	1/2"	1 1/16"	23"	oak	2
M	1 1/16"	3 3/4"	23"	walnut	1
N	1 1/4"	5"	21"	walnut	2

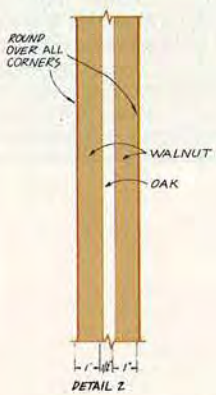
*Some parts are cut larger initially, then trimmed to finished size. Please read instructions before cutting.

Supplies: 2—#12×2½" oval head brass screws, 2 brass finishing washers, 18—#4×¾" flathead wood screws, 20—⅜"×1½" dowels, 4—⅜"×2" dowels, ¼" mirror 17⅝"×48", red rosin paper (available at your local lumberyard) or heavy brown wrapping paper.

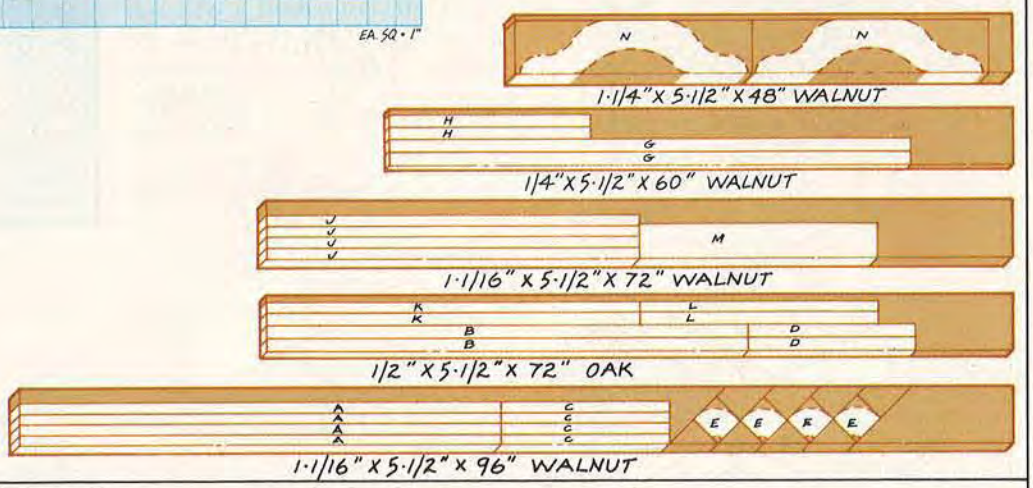
FRONT VIEW



GRID DETAIL (N)



DETAIL Z



and drill two ⅜" dowel holes 1 1/16" deep, corresponding to those in the vertical uprights. Cut N to shape.

4 Sand the stand parts smooth and rout the legs, cross support, and vertical supports, using a ¼" round-over bit.

5 Glue and clamp the stand pieces together, being careful to maintain squareness. Finish-sand the frame and stand assemblies. Finish as desired.

6 Install the mirror and the hardboard backing. (We placed red rosin paper between the mirror and hardboard to prevent the mirror silver from scratching. Heavy brown wrapping paper will also work.) Mount the mirror frame to the stand, using the 2½" brass screws, finishing washers, and the walnut pieces (I). ■

QUICK-

A $10 pipe clamp fixture makes this workbench vise inexpensive, easy to build, and even easier to use.

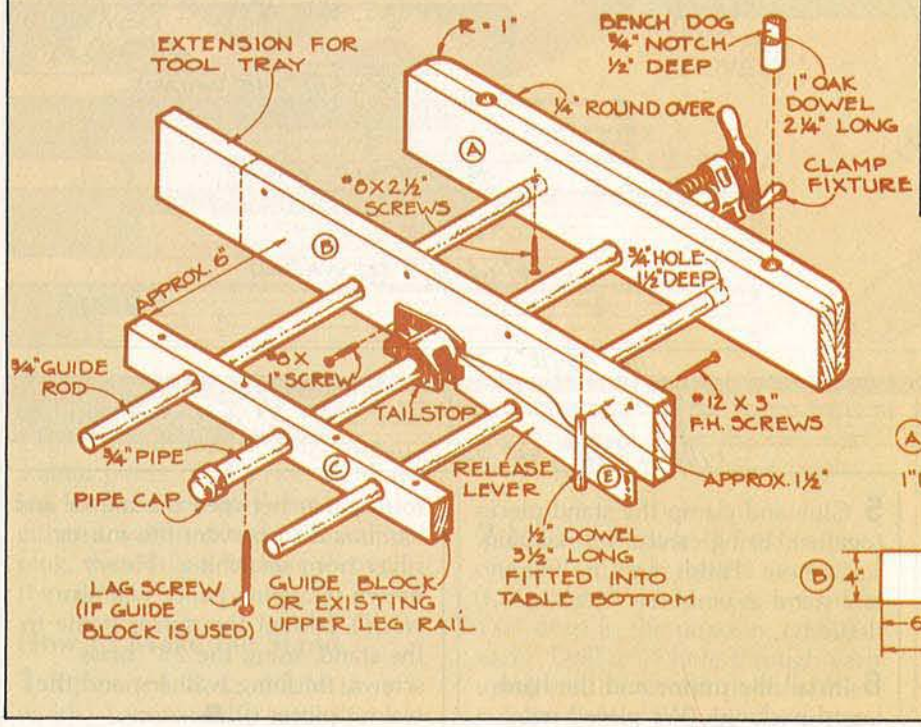
NOTE: We dimensioned this vise for a bench top that measures 2″ thick × 30″ wide (25″ table with a 5″ tool tray). If your workbench has a different thickness and width, you'll have to adjust the figures accordingly.

Bill of Materials

Part	Finished Size*			Material	Qty.
	T	W	L		
A	2⅛″	4″	25″	maple, laminated	1
B	1 1/16″	4″	30″	maple	1
C	1 1/16″	1⅞″	11½″	maple	1

*Some parts are cut larger initially, then trimmed to finished size. Please read instructions before cutting.

Supplies: 2—¾″×24″ steel bars, 1—#50 Jorgensen clamp fixture, 1—¾″×26″ black pipe (threaded at both ends), 2—#8×1″ flathead wood screws, 5—#12×3″ flathead wood screws, 2—#8×2½″ flathead wood screws, ½″ dowel 3½″ long, 1″ dowel 14″ long (enough for 6 bench dogs), ¾″ pipe cap.

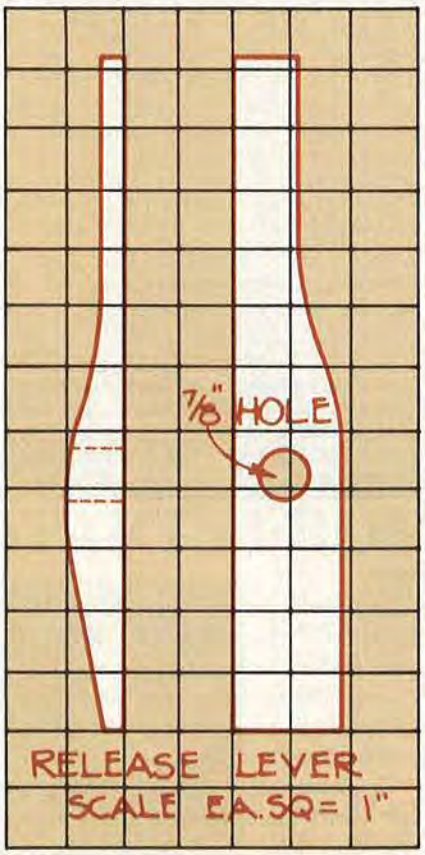


CLAMP END VISE

Building and Installing the Vise

1 Rip the 1 1/16"-thick maple to 4" for parts A and B. Crosscut two 26" pieces for A and one 30" piece for B. Glue and clamp the two 26" lengths together to form A.

2 Bore two 13/16" holes for the guide rods and one 1¼" hole for the black pipe through B (see the dimensioned Rear Jaw in the drawing on the opposite page for positioning).



3 After the glue has dried and you've removed any excess, trim A to 25". Scribe a 1" radius on the two front corners, and cut on the bandsaw. Clamp A to B and, using the previously drilled holes in B as a positioning template, mark the corresponding holes on A. Bore a 1¼" hole completely through A for the ¾" black pipe. Bore two ¾"-diameter holes 1½" deep for the guide rods.

4 Screw mount the pipe clamp hardware to parts A and B. (We used the pipe clamp itself to align and hold A and B together. Then, using a 5/32" metal-cutting bit, we drilled one hole through each piece of hardware and installed the #8×1" wood screws.)

5 Cut a guide block to size (see the Guide Block in the drawing on the opposite page) and drill holes as dimensioned. The guide block should be mounted about 6" from B on the underside of the workbench. These holes must line up with the ones in A and B to prevent the rods and pipe from binding. (As it turned out, the upper leg rail on our bench was positioned perfectly for this purpose, eliminating the need for constructing a guide block.)

6 Glue and screw mount B to the bench. (We countersank 5 equally spaced #12×3" wood screws through B into the workbench end.)

7 Using a router and a ½" roundover bit, rout the outside edges of A. Sand A and B smooth.

8 Fit the guide rods into A, then use a 5/32" metal-cutting bit to drill a hole into A and just through each guide rod (approximately 1¾" deep). Now, using a 3/32" bit, drill a 2½"-deep hole in A through the 5/32" hole. Install #8×2½" screws to hold the guide rods in place.

The Quick-Release Lever

1 Cut part C to size. Transfer the pattern at left to 1" graph paper, then onto part C. Drill a ⅞" hole through it and cut the lever to its finished shape.

2 Screw the black pipe into the clamp fixture on A. Install the black pipe and guide rods through the holes in B, the release lever, and through the guide block.

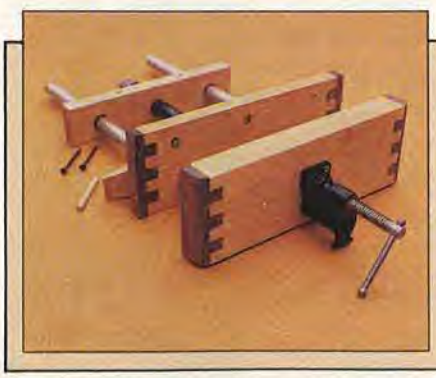
3 Position and bore a ½" hole 1" deep in the table bottom and install a ½" dowel 3½" long to prevent the release lever from sliding along the guide rod. Screw the pipe cap to the black pipe. Choose and apply finish. (We finished all the parts with tung oil.)

Note: To use the vise, pull the release lever toward part B and pull out on the vise. Once you have reached the length needed for clamping, release the lever and give the clamp a quick jerk to set the tail-stop on the ¾" black pipe. Insert the project to be clamped and tighten the screw handle.

Bench Dogs and Dogholes

1 To clamp large projects easily, cut 1"-diameter dogholes 1½" deep in part A as shown in the drawing, then drill corresponding holes at regular intervals along the bench top. (We placed our first bench-top doghole 4" in from B and cut the others at 10" intervals.)

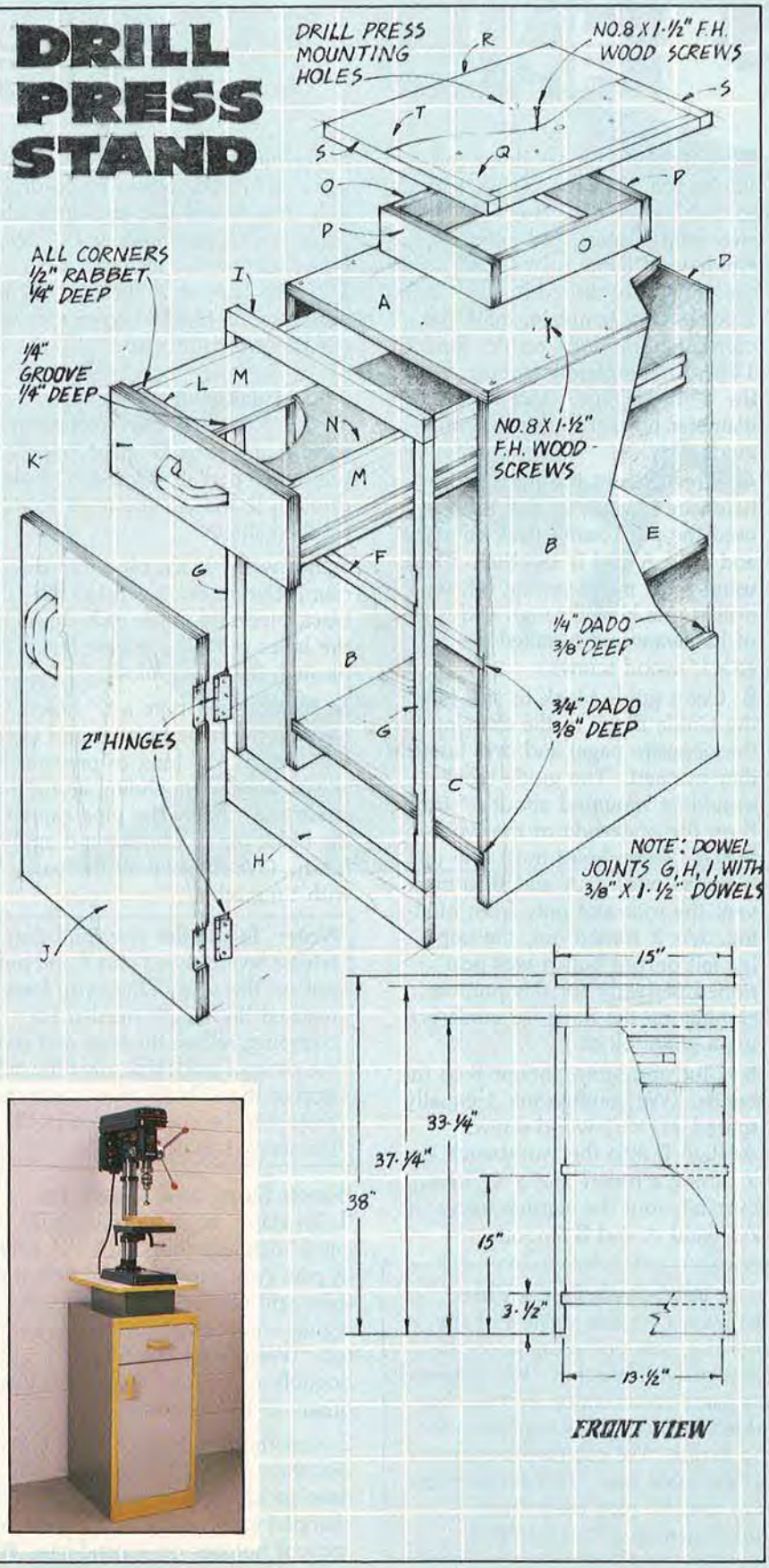
2 Cut the bench dogs 2¼" long and then cut a ¾"-long notch ½" deep in one end of each. We clamped each dowel in a handscrew and cut notches on a band saw. ■



Woodworker's Vise

Actually a smaller version of the end vise, this one mounts on the front of workbenches. We followed the same construction process, but added box-jointed walnut ends to the maple. We cut the box joints on the table saw. This smaller version uses ½" pipe rather than ¾", and Jorgensen #52 rather #50.

DRILL PRESS STAND



Bill of Materials					
Part	Finished Size			Material	Qty.
	T	W	L		
A	¾"	15"	19"	plywood	1
B	¾"	19"	32½"	plywood	2
C	¾"	18¾"	14¼"	plywood	1
D	¼"	14¼"	32⅞"	hardboard	1
E	¾"	18"	14¼"	plywood	1
F	¾"	¾"	14¼"	pine	1
G	¾"	¾"	28¾"	pine	2
H	¾"	3"	15"	pine	1
I	¾"	1½"	15"	pine	1
J	¾"	13⅜"	23"	plywood	1
K	¾"	5½"	13⅜"	plywood	1
L	½"	5½"	12"	pine	2
M	½"	5½"	18"	pine	2
N	¼"	12"	17½"	hardboard	1
O	¾"	4"	12¼"	plywood	2
P	¾"	4"	9"	plywood	2
Q	¾"	13½"	18¼"	plywood	1
R	¾"	¾"	18¼"	pine	2
S	¾"	¾"	15"	pine	2

Supplies: 2—18" drawer slides, 2—2" butt hinges, 1 door catch, 2—hardwood pulls, #8×1½" flathead wood screws, 6d finish nails, contact cement, polyurethane varnish, paint, 4—⅜"×1½" dowels, plastic laminate

Print this article

This drill-press stand measures 38" high, 19¾" deep, and 15" wide. If you prefer a different height, change the width of pedestal pieces O and P to raise or lower the pedestal top.

To construct the stand, assemble the cabinet carcass (A–F) as shown. Use dowel joints to build the face frame (G–I). Glue and nail the face frame to the cabinet. Build and fit the door (J) and drawer (K–N).

Construct the pedestal (O, P) and top (Q–S). Countersink and screw the top to the pedestal, and the pedestal to the cabinet. Cover the top with laminate. Use carriage colts to bolt your drill press through the top (Q) and through the cabinet top (A) for a sturdy support. Paint, let dry, and attach pulls and hardware. ■

CONOVER

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C030 ½" x 8 **$39.00**
C035 ¾" x 6 **$43.25**
C040 1" x 6 **$47.25**
C025 extra cutter **$5.75** (fits any of the above boxes.)

C045 set of all 3 kits **$122.00**

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card number _____

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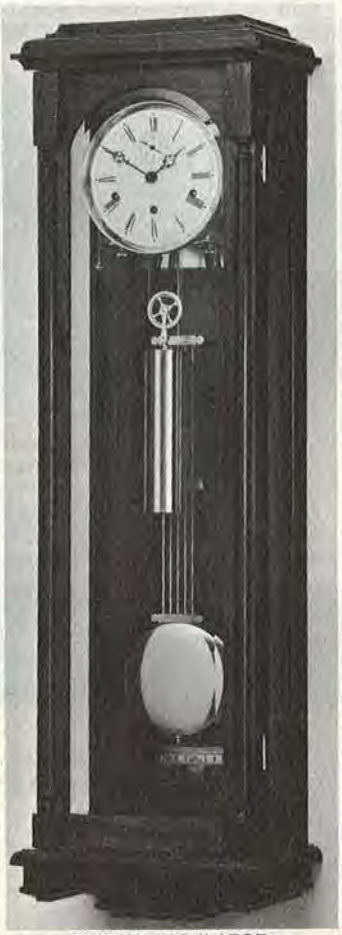

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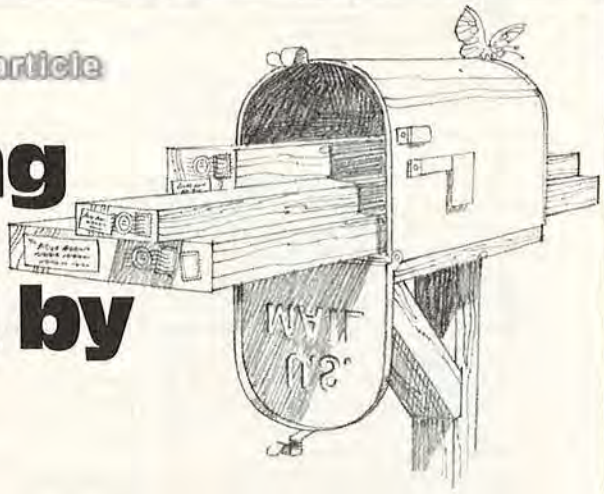
Print this article

buying wood by mail



Finding the right materials is a predictable problem whenever you start an unusual woodworking project. The farther you live from big-city specialty stores, the bigger the problem, because most lumberyards can't afford to stock seldom-requested hardwoods or veneers.

You face a difficult choice: seek out and visit the nearest supplier, whose store may be hundreds of miles away, or send for catalogs published by mail-order wood merchants and let them come to you.

Mail-Order Advantages

Because they sell to customers throughout the nation and even around the world, the dozen or so companies marketing wood products by mail in the United States can offer selections that far exceed local suppliers'. Constantine's in New York stocks the largest selection of veneers in the world, according to Glenn Docherty, vice president of the 172-year-old company. "We are very competitively priced because we buy our veneers from long-term sources all over the world," he adds.

Buying by mail is convenient. Drop your order in the mail (or place it by phone, if you're in a hurry) and your materials will usually arrive within a week or ten days. If you're willing to pay extra for air freight, your order will reach you in a day or two. Most dealers accept payment by charge card.

Because their success depends on repeat business, dealers in the field emphasize high-quality products, reliable, prompt service, and satisfaction guaranteed.

Says Ann Rockler Jackson, president of The Woodworkers' Store in Rogers, Minnesota, "If a customer is unhappy with our merchandise, he returns it and we refund his money. We just take everything back."

Disadvantages

When you're ready to buy, you probably want the product *right now.* So one drawback to buying by mail is having to wait to receive your purchases. And before you can even place an order, you need to locate a wood-by-mail source. To help you with this not-overly-easy chore, we've compiled a listing of over 20 such firms, beginning on page 95. You may also be able to uncover other outlets by looking in the various other woodworking publications.

Also, there's nothing quite like holding one piece of wood to compare it with other boards. Naturally this isn't possible by mail order. Instead, you're limited to thumbing through a catalog.

Moreover, you usually have to send for the catalog first, and include a dollar or two to cover postage and handling. But in most cases, the dealer will refund the charge with your first order.

Some mail-order merchants require their customers to meet minimums—50 board feet of each type of wood bought, perhaps, or a minimum dollar amount. (Others will sell wood by the linear inch.)

Continued on page 94

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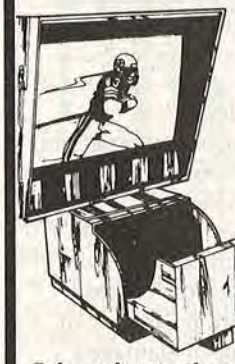

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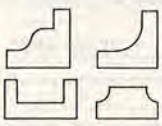

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LUMBER BUYMANSHIP

Continued from page 92

buying wood by mail

Other things you should know

Even the most clearly written, best-illustrated catalog may not answer all your questions about a product. To avoid misunderstandings, it's important to be knowledgeable about the product.

"The worst thing we run into is the occasional novice who does not understand what a board foot is or that hardwoods come in random widths and lengths," comments Bob Carr, president of Educational Lumber Company, Inc., Asheville, North Carolina. "We kind of screen the customers. If they don't understand how things work, we suggest books they can buy and read to get started," he adds.

Plan your materials needs carefully so you will order enough but not too much. "When you contact the supplier, include a brief description of what you're going to build, including major dimensions," suggests Jay McBride, owner of World Timbers, in Los Angeles, which specializes in exotic woods.

"If you call in and say you want a piece of rosewood 2 inches thick by 12 inches wide by 8 feet long, I'll want to know how you will use it. Perhaps you'd end up cutting it down into pieces 12 inches long, 3 inches wide and so on. I may be able to suggest alternatives that better fit the use and save you money," McBride says.

When your order arrives, check it immediately to make sure you received everything you ordered and in good condition. If part of the order is missing or damaged, contact both the merchant and the post office or delivery service immediately so the supplier can make up the difference or retrieve the damaged goods and replace them with sound ones.

"Buying by mail order is fast, safe, and convenient," Ann Rockler Jackson points out. And for out-of-the-ordinary items, it's often practical, too.

Continued on page 95

Continued from page 94

buying wood by mail

Mail-Order Lumber Outlets

Here are a number of direct-mail outlets for lumber supplies of all kinds. The letters at the end of each listing relate to the legend below and indicate the company's specialties.

LEGEND:
V = Veneers
P = Plywood
T = Turning stock
H = Hardwoods
S = Softwoods
TS = Thin stock

American Woodcrafters
1025 South Roosevelt, Dept. W
Piqua, OH 45356
515/773-7414 X291
Free Catalog
V, T, H.

Black Mountain Wood Co.
P.O. Box 3525, Dept. W
Portland, ME 04104
207/772-3332
Price list: $1
P, T, H, S.

Boulter Plywood
24 Broadway, Dept. W
Somerville, MA 02145
617/666-1340
V, P, H, S.

Certainly Wood
12613 Centerline Rd., Dept. W
South Wales, NY 14139
716/655-0206
Free Catalog
V, P, H, TS.

Condon, Maurice L., Co., Inc.
248 Ferris Avenue, Dept. W
White Plains, NY 10603
914/946-4111
P, T, H, S.

Constantine's
2065 Eastchester Rd., Dept. W
Bronx, NY 10461
800/223-8087
Catalog: $1
V, P, T, H, S, TS.

Craftsman Wood Service Co.
1735 W. Cortland Ct., Dept. W
Addison, IL 60101
312/629-3100
Catalog: $1
V, P, T, H, TS.

Craftwoods
10921 York Road, Dept. W
Cockeysville, MD 21030
301/667-9663
Catalog: $2
Free price list
V, P, T, H, S, TS.

Cryder Creek Wood Shoppe Inc.
101 Commercial Avenue, Dept. W
Whitesville, NY 14897
607/356-3303
Free catalog
T, H

Educational Lumber Co., Inc.
P.O. Box 5373, Dept. W
Asheville, NC 28813
704/255-8765
Catalog: $1
V, P, T, H, S.

General Woodcraft
100C Blinman Street, Dept. W
New London, CT 06320
203/442-5301
V, P, H, S, TS.

Continued on page 97

Once In A Lifetime Opportunity!

Laminated Steel Chisels You Save $20.00

Why the big discount?
We keypunched the wrong item number on the telex and received thousands of 10-piece laminated steel sets instead of the sets we wanted. Even for us, that's way too much.

What are laminated steel chisels?
During the forging of these chisels, a very hard (Rockwell 64-66C) high carbon, alloy steel (the blade) is fused to a very soft steel (the upper body).

What are the advantages of this production method?
What emerges is a tool capable of receiving and holding an extremely hard edge. Without the soft, upper body's ability to absorb the shock of mallet blows, the extraordinarily hard edge would be impractical.

These fine tools have additional, exceptional features:
1. A combination socket-tang construction for added strength.
2. A hollow ground back that minimizes the time spent in sharpening. To maintain a perfect edge, the back of the chisel blade must be absolutely flat. Thus, when the need arises, it is not enough to sharpen only the bevel; the back must also be worked on the stone.
3. Iron hoops, fitted to the handle ends, inhibit splitting.
4. Japanese red oak handles are long lasting and aesthetically pleasing.

Does your regular 90-day guarantee apply to the special offer?
Definitely! Everything we sell at The Fine Tool Shops is unequivocally covered by our 90-day guarantee of satisfaction. If you are anything less than delighted, return the product to us for a full and immediate refund, including the return postage.

What are the specs?
Overall length: 9" Blade length: 2¼" Sizes (converted from mm) ⅛", ¼", ⅜", ½", ⅝", ¾", ⅞", 1", 1¼", 1½".
Our regular, low everyday price is $94.95 per set. Now, you can benefit from our goof and own these magnificent tools for only $74.95. This offer expires when present stock has been depleted or 31 Dec. 1984, whichever comes first.

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Danbury, CT 06810

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Card No. _____
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SIGNATURE _____
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FJ

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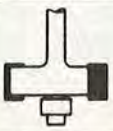	#11	3/8" RABBETING	Deep 3/8"	1¼"	1/2"	14.00
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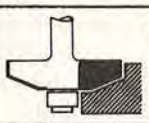	#15	RAISED PANEL	20° Angle	1-5/8"	1/2"	25.00
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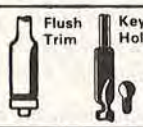	#13	1/2" FLUSH TRIM		1/2"	1"	8.50
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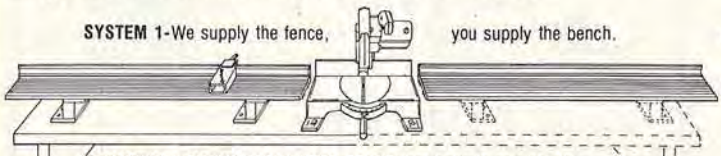

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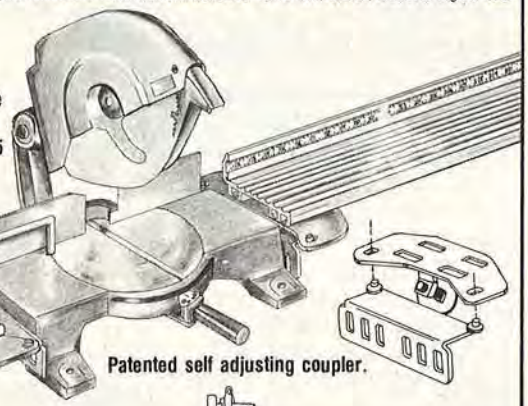

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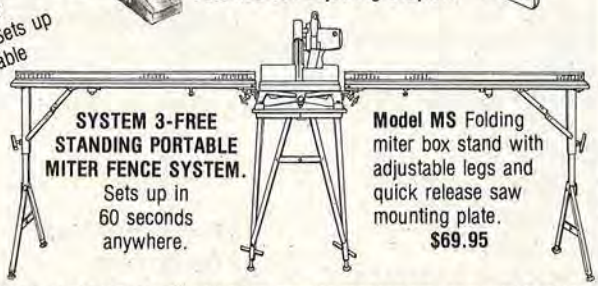

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Today, through increased world trade and an international hardwood lumber industry, exotic woods are more commonly available to the home woodworker. One, however, is still so rare that when offered for sale its price is by the ounce. And that wood is pink ivory.

Noted for its color and pearl-like luster, pink ivory remains a real treasure among wood connoisseurs. Growing on rocky soil in the arid, remote areas of Transvaal and Natal, two provinces in South Africa, this tree for centuries has been sacred to the Zulu tribe. By tradition, only a chief can fell a pink ivory tree, and then only when his son reaches manhood. To mark the occasion, the young Zulu fashions a spear from the wood. The pink ivory remaining decays or is burnt. Anyone of lesser stature possessing the sacred wood may be killed.

Capped with ebony, this pink ivory humidor made by Jim Woodruff may be worth its weight in more customary valuables.

According to the South African government, only about 50 pink ivory trees remain in native areas. This rarity, plus the conditions of its harvesting and the penalties attached to its possession, make pink ivory's high value easy to understand.

Some pink ivory does find its way into the outside world through clandestine means, but never in commercial quantities. A traveler to Johannesburg may be lucky enough to purchase a pair of small earrings, or a chunk of pink ivory from an international collector. But even in this trading center, it's easier to locate quality diamonds than this precious wood, which currently sells for about $1.50 an ounce. ■

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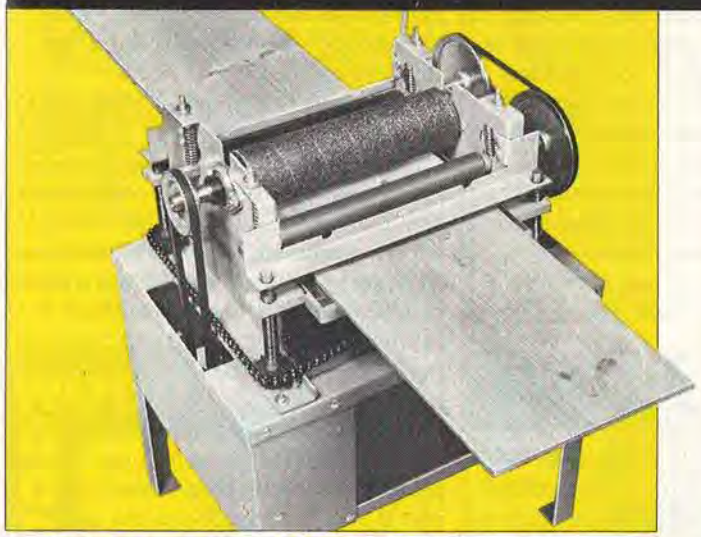

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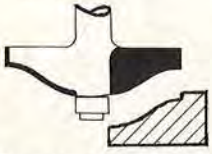

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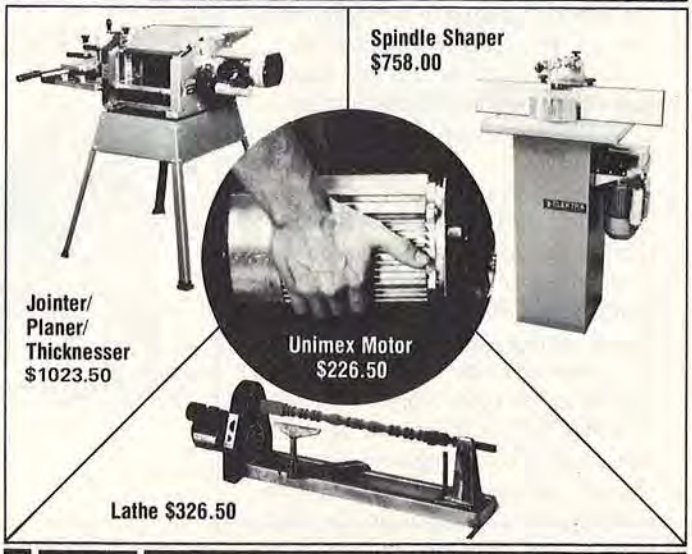

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TOOLS AND TOOL COLLECTING

the saw scene

Testing the mettle of a Disston "London Spring" saw.

Print this article

Saws have cut their way through recorded history, even as far back as the Stone Age, when tool builders chipped crude saws from stone. As new technologies emerged, craftsmen gained greater control over their work, producing successive generations of improved saws from copper, bronze, and then iron. None of these saws was very efficient, however, and all required frequent sharpening.

Iron-working methods continued to improve, and saw plates were made thinner and stronger. But as the plates got thinner, the saws tended to kink on the push stroke. So, from the sixteenth to the mid-eighteenth century, the teeth on most saws were arranged to cut on the pull stroke only, a design still used by Oriental saw makers.

When steel was introduced to toolmakers, it finally became possible to manufacture extremely strong and resilient saws. Because the English led the world in early steel technology, they manufactured the finest saws.

But when U.S. manufacturers set their sights on challenging Britain's industrial supremacy in the nineteenth century, several American saw makers set out to make superior products. Henry Disston, a member of this group, was so successful that his Disston "London Spring" saws continue to sell for premium prices ($65–$85) today—both in the U.S. and England!

As you can see in the photo, you can bend one of these beauties into a complete circle, then release it, and it will snap back straight as a die. Try that with any other saw, if you dare.

Several years ago, a carpenter in northern Vermont was asked to comment on his "London Spring" saw. "The best saw I've ever used," he said. "It doesn't even leave any sawdust." ■

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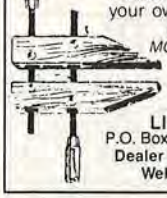

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TOOL BUYMANSHIP

Continued from page 78

dado blades

but other blade types require different solutions.

With the least expensive method, called *flat-grinding*, manufacturers machine the blade to a constant thickness, then bend or "set" its teeth alternately—first to one side and then to the other—so that when the blade is in motion, the saw kerf is effectively wider than the blade's body.

Another option is *hollow or taper grinding*. Teeth are left at the original blade thickness, and the steel between them and the arbor hole is ground away to make a thin body. The process produces smooth-sawing blades that, in some instances, perform as well as more expensive carbide-tipped blades.

On a *thin-rim* blade only a portion of the blade body is ground away. This limits the blade's maximum depth of cut.

Tooth Numbers and Configuration

Up to a point, the odds for producing sharp, no-fuzz, no-splinter dado cuts increase with the number of teeth on the dado assembly. The best (and most expensive) dado head we tested was a stack set with 24 teeth on each outside cutter. It came equipped with star-shaped inside chippers with as many as eight teeth.

Tooth configurations of different dado blades. Left to right: gradually alternating pattern of bevels on an adjustable, carbide blade; pitched bevels to one side on a non-interchangeable dado assembly carbide cutter blade; alternating bevels with raker teeth of an interchangeable dado assembly cutter blade; flat-topped teeth of a chipper blade.

You shouldn't choose a dado assembly by focusing on a single variable, however. The configuration of the teeth can be just as important as their number.

On adjustable blades, the two work in tandem. To cut the entire groove, the tops of some teeth need to be beveled in one direction, and others must be angled the opposite way. The angle of the bevel shifts slightly from one tooth to the next. The more teeth, the subtler the shift, and the smoother the cut.

On stackable sets, the inside chippers have square or flat-topped teeth. If the outside cutting blades can be used on either side of the set, they are top beveled in alternate directions. On the best stack set we tested, each cutter is designed for a specific side of the assembly and is top beveled in one direction only. Top-performing cutting blades also have flat-topped *rakers* interspersed between the cutting teeth for sawdust removal.

With carbide-tipped blades, we found that the sharper the bevel's angle, the cleaner the kerf. A very steep angle may dull comparatively quickly, however.

Additional Purchase Points

Dado assemblies put a great deal of strain on saws. To avoid overloading or possibly damaging your saw's motor, choose a product that is at least 2" smaller in diameter than your normal saw blade.

Make sure that the assembly fits your saw's arbor—and not just its diameter. Dado blades should be securely fastened to the arbor. The assembly shouldn't be so wide that you can only tighten the arbor nut a few turns.

Finally, remember that an adjustable blade or stackable set won't work with a normal table saw insert. You'll need to construct or purchase an insert to fit your assembly. ■

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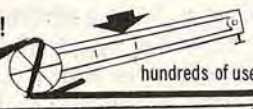

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NOW YOU CAN BUILD IT

Continued from page 76

simple cabinet desk

shown on page 76. Test all cuts on scrap lumber before cutting the oak fronts.

3 After sanding all parts, glue and clamp the drawer fronts and the door front together. Work on a flat surface to keep the fronts flat and square when clamping.

4 Cut the drawer ends (M) and sides (N) from the pine drawer-side material. Cut a ½" rabbet ¼" deep in the sides (M) to receive the ends. Cut the drawer bottoms (O) and dry-clamp the drawers together to check for proper fit. Adjust if necessary, then glue and nail M, N and O together. (We used three 4d finishing nails at each corner.)

5 Attach drawer-slide hardware to the drawer-slide mounting blocks and to the drawer sides, following the directions supplied with the slides. After installing the drawers, center the drawer fronts on the face-frame openings and attach to the drawers. (We drove four #8×1" wood screws into each drawer front.

6 Mark and drill pilot holes for mounting the hinges on the door and face frame. (You'll attach the hinges after varnishing). Mark and drill holes for the drawer pulls on the front of each drawer. Drill holes for two door pulls to match those on the two lower drawers opposite. (Pulls should be mounted after finishing.)

Laminating the Top

1 Cut the particleboard (P) to size. Cut both the plastic laminate top (Q) and the balance sheet bottom (R) to size plus 1" on all four sides to allow for edge trimming and positioning error. (Balance sheet, a plastic sheet goods, stabilizes laminated assemblies to prevent warping or bowing.)

2 Following the manufacturer's instructions, apply two coats of contact cement to the laminate and the particleboard.

3 Position and apply laminate with extreme care: once the two surfaces touch, they can't easily be repositioned. (We called on two people for this operation. We placed waxed paper between the surfaces until they were properly aligned, and then, starting at one end and working toward the other, removed the waxed paper. To ensure good adhesion between the particleboard and laminate, we used a mallet and block of wood, and working from one end to the other, hammered the surfaces.)

4 Follow the same procedure to apply the balance sheet to the bottom of the particleboard.

5 Use a router equipped with a laminate trimmer to trim the laminate and balance sheet flush with the particleboard. Glue and nail decorative molding (Q, R) to the front and sides. (If you plan to position the desk away from a wall, you'll want to trim the back edge with molding, too.)

6 With the desk top facedown on a flat surface, set the cabinets (without drawers), also upside down, on it. Position the cabinets so they are flush with the back of the top and abut the molding at each end. Cut positioning blocks (U) and set one block in place at the four inside corners of each cabinet. Glue and screw-mount the blocks to the underside of the desk top. Turn the cabinets and desk top right side up. The blocks act as guides so that the top sits in place on the cabinets.

7 Set all nails and fill nail holes with wood putty. Sand the wood surfaces smooth and finish as desired. After the finish has dried, attach hinges and the door pulls. Hang the door. ■

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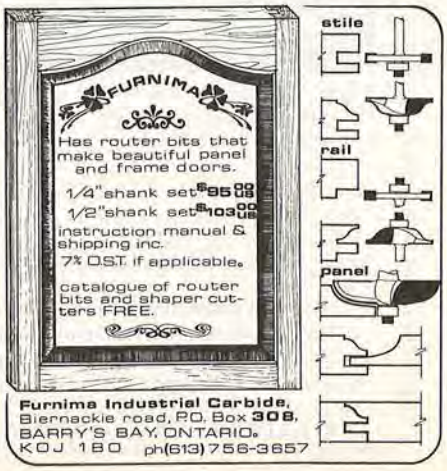

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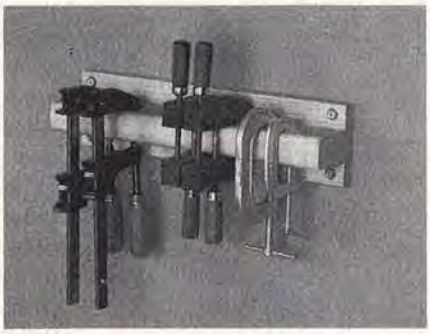
SCRAP WOOD PROJECTS

TWO great ideas from our shop



Drill Bit Holder

This nifty wall attachment stores drill bits within an arm's length of our drill press. We use it to keep a variety of bits and plug cutters neatly arranged. (The holder could easily be adapted for router bits, too.) The back of the holder measures ¾"×7"×18"; the angled front piece, 1½"×5½"×18".

To construct the holder, cut the front and back pieces to length and width, ripping one edge of the front piece at a 25° angle.

Then, mark the hole locations. (We laid out four rows and spaced 14 holes 1" apart in each row. We chose ¼" holes ½" deep for the first two rows; 5/16" holes ¾" deep for the third row; and ⅜" holes 1" deep for the last row. Check your inventory of drill bits to see if these dimensions will work for you.)

When you drill the holes, also drill a 5/16" hole in each corner of the back piece for wall mounting. Glue the angled edge of the front piece to the back. (We beefed up our holder by gluing a block against the back, under the angled front piece.) Mount the drill bit holder using four #10×1½" wood screws with finishing washers.

Clamp Rack

Small clamps were forever scattered around our shop until project builder Jim Boelling decided that enough was enough and created this handy wall rack. Now we know where to look for C-clamps, handscrews, and small bar clamps (and most of us know where to replace them).

The back piece of the holder measures ¾"×3½"×18"; the front, 1½"×2½"×18". After cutting these pieces to size, we rounded the front edge of the front piece with a router and ¼" round-over bit. After drilling a 5/16" hole in each corner of the back piece, we glued the two parts together. We used four #10×1¾" wood screws and finishing washers to mount the rack. ■

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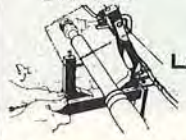

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ASSOCIATIONS YOU SHOULD KNOW ABOUT

John Scheeler's "Goshawk and Crow" won the "Best In World, Decorative Life-Size" award at the 1981 Ward Foundation world competition. Photograph courtesy of the Ward Foundation

THE WARD FOUNDATION

Woodworkers form a vast network of individuals who are eager to share knowledge, skills and experience with one another. This desire to trade information has spawned a variety of membership organizations devoted to woodworking specialties of all kinds.

Some people consider wildfowl carving and painting a craft, but to the members and staff of The Ward Foundation, it's an art—the only art form, they say, that is native to North America.

Named in honor of Steve and Lem Ward, brothers considered to be pioneers of decorative bird carving, the nonprofit organization is dedicated to wildfowl carving and painting, and to the historical, educational, and environmental aspects of the art.

According to organization officials, decoy carving had reached a plateau by 1968. There were good carvers around, but they were widely scattered across the nation, and new carvers weren't being attracted to their ranks. To remedy the situation, a group of carvers started The Ward Foundation and set out to establish a museum and programs for wildfowl artists.

Today, through international competitions, exhibitions, seminars, workshops, and a museum program, the association has fostered a resurgence of interest in wildfowl carving and painting. New carvers—who design their work "to be a bird"—have picked up the skills of older masters, whose sole purpose was to create a decoy that would "catch a bird."

The Ward Foundation supports the North American Waterfowl Art Museum, a Salisbury, Maryland, institution that tells the story of decoy and wildfowl carving through displays of classic hunting decoys and works by today's carvers. Dioramas, video presentations, and interpretive exhibits re-create the world of wildfowl at the museum.

The foundation's 16th Annual World Championship Wildfowl Carving Competition will be held in Ocean City, Maryland, April 25–28, 1985. Hundreds of carvers and painters will compete for cash prizes and international recognition in a number of categories. Techniques will be studied, works will be sold, and information will be traded at the annual event, which, in addition to carvers, attracts collectors and people who are simply interested in wildlife art.

Individual membership in The Ward Foundation is $20 a year. Family memberships cost $30. Members receive a free quarterly magazine, free museum admission, discounts on museum purchases, and window decal.

For information and membership application, contact:

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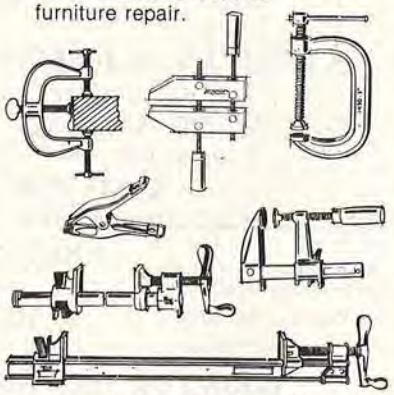

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JUST FOR KIDS

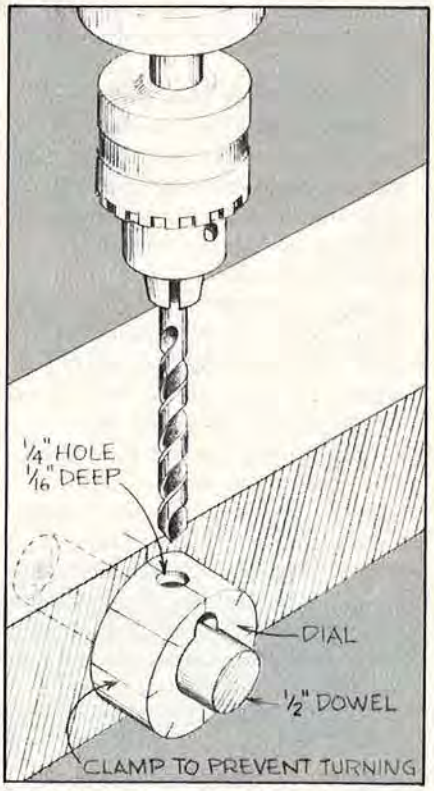
Continued from page 56

color me safe

hole in the center of each dial, using the center point as a drilling guide. We made the jig shown below to hold the dials for drilling. First, we bored a 1¼" hole ½" deep into a scrap of wood clamped to the drill press table. Without moving the clamped jig, we removed the 1¼" bit and inserted a ½" bit in its place. (If the dials turn during drilling, line the ¼" hole with sandpaper and tap the dials into it.)

3 Move the jig slightly and drill a 5/16" hole through the dials alongside the ½" hole. Chisel the edges between the ½" and the 5/16" holes to clean the notches.

4 Using the color-dot guide marks for reference, drill ¼" holes around the perimeter of each dial. (We used the jig shown below and a depth stop to drill the holes 1/16" deep.)



5 Mark the location of the lock-bolt sliding pin (G). Do the same for the lock pins (I). To do this we slid the lock bolt through the holes in parts D and E, so that the bolt protruded ½" beyond the edge of

D. Then, working from the back side of the safe door, we marked the position of the lock pins on the dowel, centering the marks over the tongues separating the dial notches. Finally, working from the door's front side, we made a mark at the far right-hand side of the slot to position the knob shaft (G).

6 Remove the lock bolt from the door and drill ¼" holes 5/16" deep to accept all the lock pins. The pins must be in a straight line that is offset 180° from the knob shaft. (We clamped the lock-bolt dowel in a handscrew and drilled the holes on a drill press, again using the depth stop for consistent depths.)

7 Paint the color codes on the dials (J), keeping in mind that the color that opens the lock is opposite the notch in the dial. (We used model car paints in eight distinct colors.)

8 Dry-fit the lock mechanism, checking for smooth operation. You may have to sand or file the parts to achieve the proper movement.

9 Spread a small amount of paraffin on the lock bolt, the holes and notches in the dials, and the holes in parts D and E to ensure a smooth sliding action. Then, reinstall all the lock parts, and carefully glue parts G and I into the lock bolt. Form the wooden knob (K) from a ¾" dowel. Drill a ¼" hole ⅜" deep in the knob; glue onto G.

10 Cut the faceplate (L) and check its fit over the tumblers. Make sure the dials turn freely before screwing the plate to the door.

11 Install the door. Glue the door stop (M) in place so door closes flush with the front of the safe.

12 Sand and varnish the safe. (Be careful to keep finish off the moving parts.) Attach rubber feet to the bottom of the safe.

How the Lock Mechanism Works

When the notches line up across the back of the lock mechanism, they align with the lock pins. This allows the lock bolt to slide back and forth through the door and the notches in the dials. Setting the combination to anything but the correct sequence puts the notches out of alignment. ■

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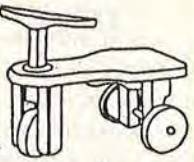

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Continued from page 54

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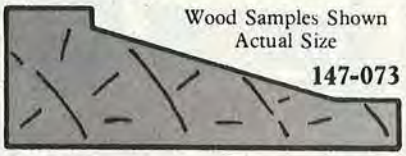
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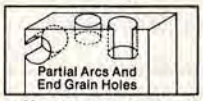

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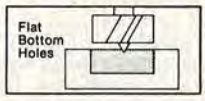

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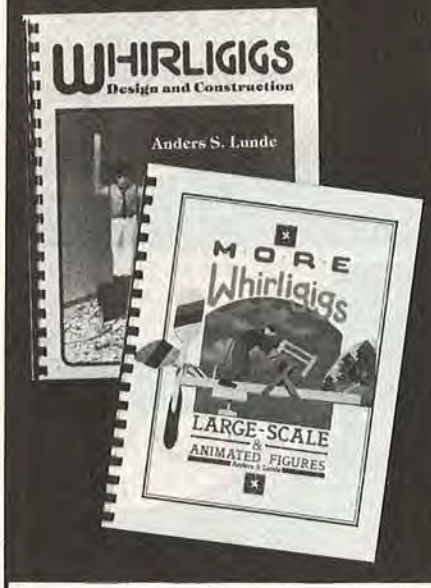

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A related math problem concerns fractions. Some people become error-prone when they have to add 1⅜" plus 3¾" plus 6⁷⁄₁₆". If you're a member of that group, you might try using metric measurements when you design your own projects.

2. Poor planning. We like to "hit the ground running" when we begin a project, but sometimes we're not quite sure of our destination. When we really think a project through at the outset, and draw plans, measured drawings, or at least sketches before we turn on a saw or pick up a tool, we tend to avoid a lot of mistakes. We also develop our projects according to a set sequence: starting with outside dimensions, we work from the outside in.

3. Mixed-up pieces. It's about as easy to mistakenly interchange project parts as it is to mark them clearly. If you label all parts and mark their face surfaces, you'll avoid this common trap.

4. Tool accuracy. "It *says* 90°, so it must *be* 90°," is a dangerous thought. Drop a try square, and who knows if it will still measure a true right angle? If you automatically assume that your table saw will cut a true 45° today because it did last week, you run a considerable risk. Check all tool setups carefully before cutting. ■

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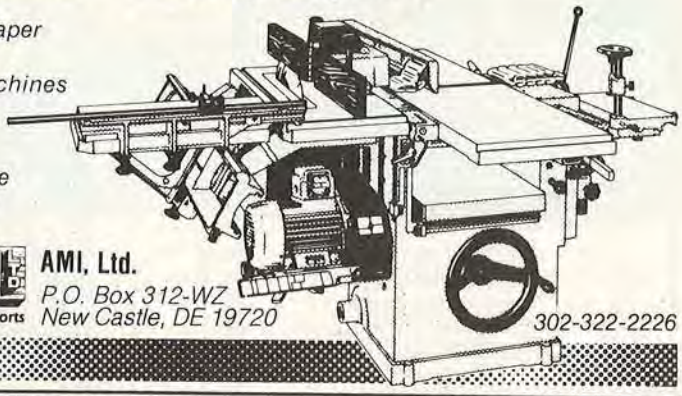

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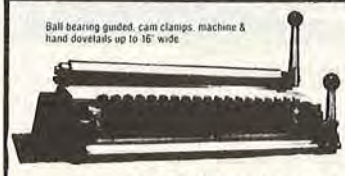
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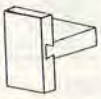

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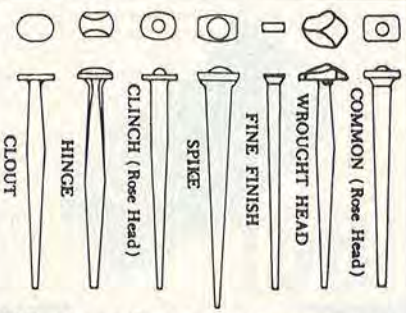

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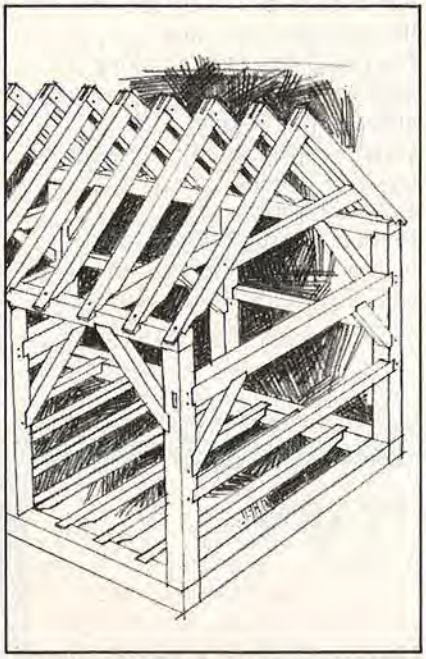
Continued from page 58

old hand ways

load. The timbers must shatter or the joints break open before the building can even begin to lean.

Braces are the most difficult part of a frame to cut and fit. I have seen men so frustrated with fitting braces that they swear never to touch a chisel again. Trimming one end makes the other end move in



an arc. It must then be trimmed, which makes the first end move again. When my apprentices framed one building, they had almost half as many braces left over—spoiled by bad cuts—as were finally used in the whole building. Each man must cut his first bad brace, and then try again and make it right. Both the building and the builder are stronger for the experience.

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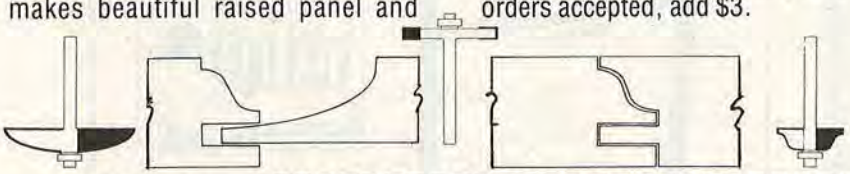

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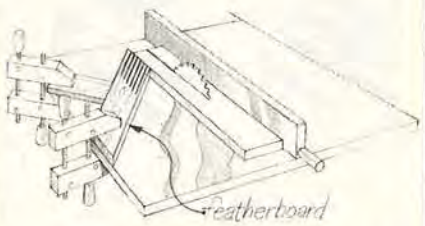
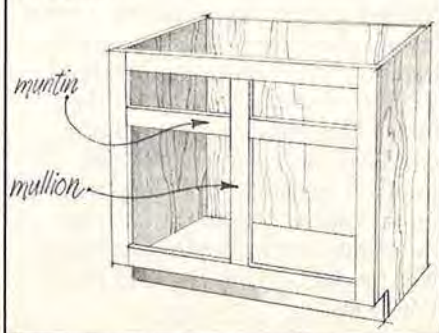
GLOSSARY

wood words

Adhesive: A substance that bonds two other materials together.
Arbor: A rotating shaft on a woodworking machine to which another rotating part is secured.
Bird's eye: Small, circular areas on wood surfaces caused by indented wood fibers.
Burl: A swirling, twisted figure in wood grain caused by growths on the outside of the tree.
Checks: Splits running along the grain in wood that occur most frequently in end grain.
Core: In sheet goods, the layer or layers of material between the face and back veneers.
Feather board: A safety device, with a series of kerfs cut into one end, that holds wood securely against a table saw fence.



Hardboard: Sheet goods produced by applying heat and pressure to wood fibers. Lignin, the substance that bonds wood cells together in trees, acts as a natural adhesive to form the fibers into hardboard.
Heartwood: The mature wood at the center of a tree. (See *Sapwood.*)
Kerf: The slot made by a saw blade as it cuts through material.
Mullion: In frame-and-panel construction, an intermediate vertical divider. ■



Continued from page 84

choosing the right clear finish

the color of most woods, linseed oil never thoroughly cures, and therefore lacks durability, darkens and deteriorates with age. Some furniture craftsmen still stand by boiled linseed oil, but with few exceptions, other penetrating oils are superior.

Danish Oil. A blend of natural oils, such as tung and linseed, and small amounts of resins, Danish oils create a natural-looking finish superior to pure natural oils alone. Danish oils greatly enhance the grain pattern and texture of the wood and, at the same time, provide a durable finish that's easy to apply and maintain. Some blends, because they contain a few resins, give wood a very natural look. Others, containing more resins, impart more sheen.

Oil/Varnish Mixtures. For people who prefer a natural-looking, wipe-on finish with more surface protection than pure or Danish oils, a mixture of oil and varnish can be the answer. Finishes such as Deftoil (Deft) and Varathane Plastic Oil (Flecto) are blends of tung oil and polyurethane, which make them extremely durable and moisture-resistant. Hope, Beverlee's, Formby, Parks, and Southerland Welles also manufacture oil/varnish mixtures. Apply these like penetrating oils.

Nontoxic Finishes. Many wooden items that contact food or the mouth — toys, cutting boards, salad bowls, and the like — require a nontoxic finish. With Behlen's Salad-Bowl Finish, a penetrating finish made specifically for these items, you simply wipe on the product and buff out the surface for a protective satin sheen that increases luster with additional applications. You can easily renew the finish when necessary.

The manufacturers of Watco Danish Oil also market their product as nontoxic (after it has cured for 30 days).

Mineral oil, a common household item, also works as a nontoxic finish. This oil provides wood with some degree of protection, but it never really hardens. ■

Note: *Before applying any finish, be sure to read the container's label directions carefully. Also keep in mind that these products are toxic, so you need to keep them out of reach of children. When applying finishes, work in a well-ventilated area that's well lit. Make sure, too, to work well away from any heat source because some of these finishes contain thinners, which can ignite easily.*

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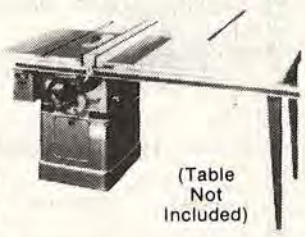

Powermatic Model 66 with Biesemeyer Fence. 10" model 66 Table Saw complete with Biesemeyer Model 50, 50 inches rt. of blade, 1 ph., 3 h.p., 230 volt, magnetic controls.

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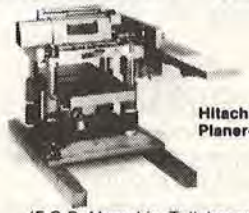

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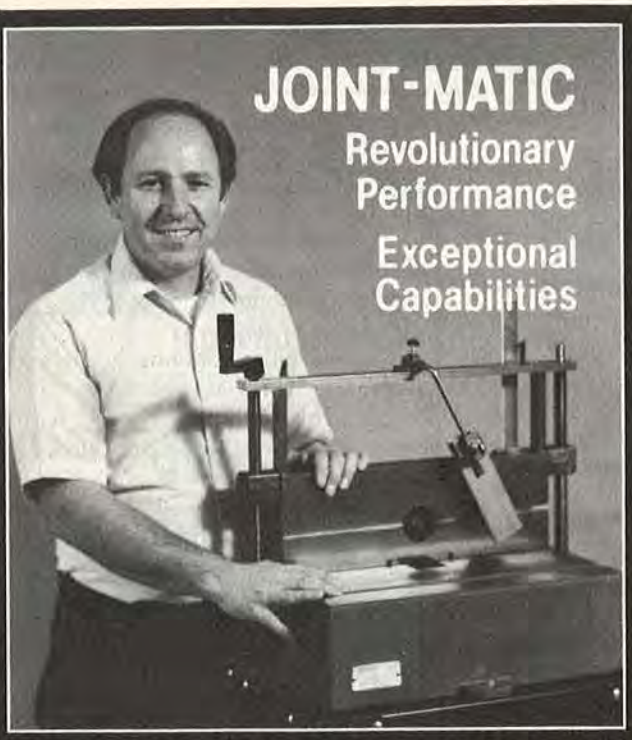

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lumbering home

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At a time when 8′ hardwood boards can cost $30 apiece, and when single sheets of veneer plywood retail for more than $100, transporting lumber and sheet goods safely—and storing them wisely—has become a valuable woodworking skill. These tips will help you prevent expensive damage.

Before you leave home

- Determine whether you can haul your load of lumber safely. An overloaded vehicle—whether it's a VW bug or a ¾-ton pickup—is an invitation to disaster. If you plan to buy more material than you can handle safely, consider some alternatives. Perhaps the store or yard will deliver to your home (you'll probably have to pay for the service). Maybe you should rent a trailer or van. Can you borrow a truck?
- If you'll be buying sheet goods or other heavy, bulky objects, bring a friend along to help you load, secure, unload, and store your purchases.
- Don't leave home without: rope, cord, twine, or elastic tie-downs if you'll need to lash material to the top of your car; a roof rack, cartop carrier, or even just a blanket to protect your car roof; cardboard or masking tape for the edges of sheet goods; and a red flag if you'll be hauling a long load. (The definition of a long load can vary from state to state; you'll be safe if you flag anything that extends past your bumper.) Don't automatically assume that your wood dealer will supply such materials.

At the building materials outlet

- Protect your purchases. Use masking tape or cardboard to cover delicate edges of expensive plywood or other sheet goods. Take special care where tie-downs intersect the edges of your lumber, particularly if you've bought softwoods.
- Secure plywood panels front-to-back and side-to-side on the top of your car. If you're hauling thin sheets, sandwich them between thicker pieces (or between lengths of lumber) for the trip home.

The road home

- Whenever possible, choose lightly traveled streets for the trip home. You'll be able to drive slowly, and if your load should shift or come loose, you can stop and fix things without dodging traffic.
- No matter how short the distance, don't even *think* about the "Of Human Bondage" transport method: one arm on the steering wheel and the other out the window clutching a board to the side or top of your car. You risk losing your wood *and* your arm.

Storing your purchases

- Store all materials off the floor in a cool, dry place.
- Wherever possible, store lumber and sheet goods flat. (If you can't do this in your shop, store materials as close to vertical as possible to avoid warping or bowing.)
- If you have room for flat storage, "sticker" each board or sheet. As you stack your wood, place stickers—long, stick-like wood scraps—at both ends and at regular intervals along the length of the piece. Stickering allows air to circulate freely around your wood and provides adequate support for the material. Use stickers of the same species as the wood you are stacking to prevent leaching of unwanted color onto expensive lumber.
- If you are stacking irregular lengths of lumber, place the longest boards on the bottom of the pile and build succeeding layers with progressively shorter pieces to construct a stable structure and to provide the greatest possible support for each board. ■

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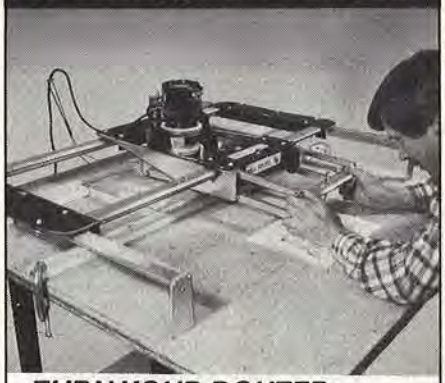

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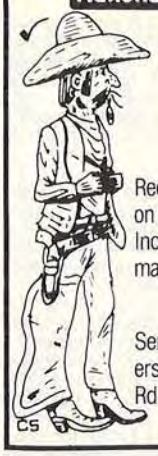

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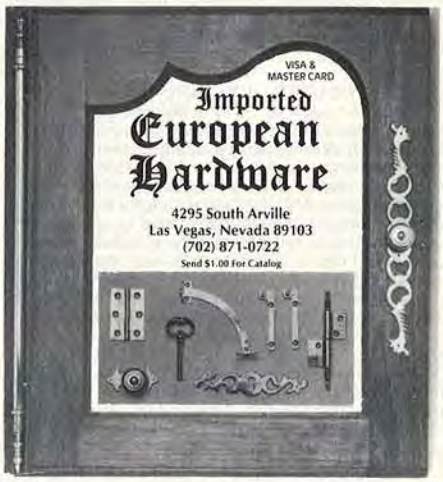

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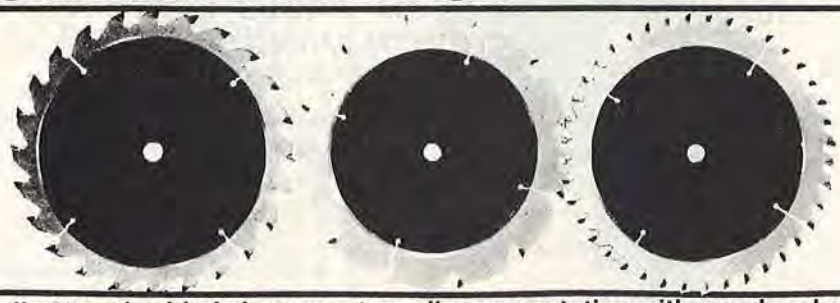

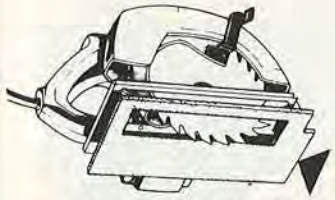

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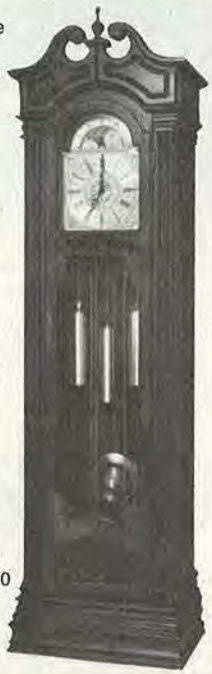

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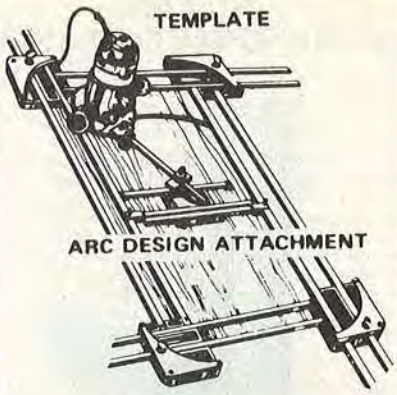

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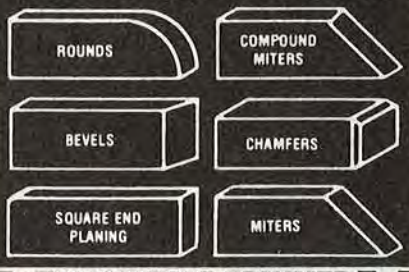

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   H. ☐ 2
   I. ☐ 3 or more

   Vans
   J. ☐ 1
   K. ☐ 2
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